```
=> fil AGRICOLA, FROSTI, CABA, BIOTECHNO, BIOTECHDS, FSTA
FILE 'AGRICOLA' ENTERED AT 16:21:49 ON 12 JUL 2006

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=> d que l79

L67          49 SEA CABOCHE J?/AU
L68          21 SEA LOOTEN P?/AU
L69           7 SEA PETITJEAN C?/AU OR PETIT JEAN C?/AU
L70      219903 SEA GLUCOSE
L71       67504 SEA POLYSACCHARIDE# OR POLY SACCHARIDE#
L72       93017 SEA BRANCH?
L79           4 SEA (L67 AND L68 AND L69) OR ((L67 OR L68 OR L69) AND (L70 OR
                L71) (5A) L72)


=> fil wpix; d que l40; d que l51

FILE 'WPIX' ENTERED AT 16:21:51 ON 12 JUL 2006
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FILE LAST UPDATED:          11 JUL 2006      <20060711/UP>
MOST RECENT DERWENT UPDATE:     200644        <200644/DW>
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

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'BI ABEX' IS DEFAULT SEARCH FIELD FOR 'WPIX' FILE


L37          21 SEA FILE=WPIX ABB=ON  PETITJEAN C?/AU OR PETIT JEAN C?/AU
L38           6 SEA FILE=WPIX ABB=ON  LOOTEN P?/AU
L39          19 SEA FILE=WPIX ABB=ON  CABOCHE J?/AU
L40           1 SEA FILE=WPIX ABB=ON  L37 AND L38 AND L39
```

inventor search

Searched by Barb O'Bryen, STIC 2-2518

```
L37          21 SEA FILE=WPIX ABB=ON  PETITJEAN C?/AU OR PETIT JEAN C?/AU
L38           6 SEA FILE=WPIX ABB=ON  LOOTEN P?/AU
L39          19 SEA FILE=WPIX ABB=ON  CABOCHE J?/AU
L41       39530 SEA FILE=WPIX ABB=ON  GLUCOSE/BI,ABEX
L42       23051 SEA FILE=WPIX ABB=ON  POLYSACCHARIDE#/BI,ABEX OR POLY SACCHARID
                E#/BI,ABEX
L43      166299 SEA FILE=WPIX ABB=ON  BRANCH?/BI,ABEX
L51           2 SEA FILE=WPIX ABB=ON  (L37 OR L38 OR L39) AND (L41 OR L42) AND
                L43


=> s l40 or l51

L90           2 L40 OR L51

=> fil capl; d que l4; d que l11; d que l12

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FILE LAST UPDATED: 11 Jul 2006  (20060711/ED)

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L1           59 SEA FILE=CAPLUS ABB=ON  CABOCHE J?/AU
L2           16 SEA FILE=CAPLUS ABB=ON  LOOTEN P?/AU
L3          276 SEA FILE=CAPLUS ABB=ON  PETITJEAN C?/AU OR PETIT JEAN C?/AU
L4            1 SEA FILE=CAPLUS ABB=ON  L1 AND L2 AND L3



L1           59 SEA FILE=CAPLUS ABB=ON  CABOCHE J?/AU
L2           16 SEA FILE=CAPLUS ABB=ON  LOOTEN P?/AU
L3          276 SEA FILE=CAPLUS ABB=ON  PETITJEAN C?/AU OR PETIT JEAN C?/AU
L6        55147 SEA FILE=CAPLUS ABB=ON  POLYSACCHARIDES/CT
L7          289 SEA FILE=CAPLUS ABB=ON  L6(L)BRANCH?/OBI
L11           1 SEA FILE=CAPLUS ABB=ON  (L1 OR L2 OR L3) AND L7
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L1            59 SEA FILE=CAPLUS ABB=ON  CABOCHE J?/AU
L2            16 SEA FILE=CAPLUS ABB=ON  LOOTEN P?/AU
L3           276 SEA FILE=CAPLUS ABB=ON  PETITJEAN C?/AU OR PETIT JEAN C?/AU
L9           182 SEA FILE=CAPLUS ABB=ON  (BETA GLUCOSIDIC)/BI
L12            1 SEA FILE=CAPLUS ABB=ON  (L1 OR L2 OR L3) AND L9
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=> s l4 or l11 or l12

L91            1 L4 OR L11 OR L12

=> dup rem l91,l90,l79
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PROCESSING COMPLETED FOR L91
PROCESSING COMPLETED FOR L90
PROCESSING COMPLETED FOR L79
L92            6 DUP REM L91 L90 L79 (1 DUPLICATE REMOVED)
                 ANSWER '1' FROM FILE CAPLUS
                 ANSWERS '2-3' FROM FILE WPIX
                 ANSWERS '4-6' FROM FILE FROSTI

=> d ibib abs hitind 1; d iall abeq tech 2-3; d iall 4-6

L92  ANSWER 1 OF 6  CAPLUS  COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER:         2000:790550  CAPLUS
DOCUMENT NUMBER:          133:351718
TITLE:                    Branched glucose soluble polymers and method for the
                          production thereof
INVENTOR(S):              Caboche, Jean-jacques; Looten,
                          Philippe; Petitjean, Carole; Fleche,
                          Guy; Comini, Serge; Backer, Daniel
PATENT ASSIGNEE(S):       Roquette Freres, Fr.
SOURCE:                   PCT Int. Appl., 33 pp.
                          CODEN: PIXXD2
DOCUMENT TYPE:            Patent
LANGUAGE:                 French
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.           KIND   DATE        APPLICATION NO.         DATE
     --------------       ----   --------    --------------------    --------
     WO 2000066633         A1    20001109    WO 2000-FR1109          20000426
         W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR,
             CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU,
             ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU,
             LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE,
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SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA,
ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE,
DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF,
CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

FR 2792941	A1	20001103	FR 1999-5523	19990430
FR 2792941	B1	20010727		
CA 2371185	AA	20001109	CA 2000-2371185	20000426
EP 1177216	A1	20020206	EP 2000-922758	20000426
EP 1177216	B1	20040825		

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
IE, SI, LT, LV, FI, RO

JP 2002543248	T2	20021217	JP 2000-615661	20000426
AT 274525	E	20040915	AT 2000-922758	20000426
AU 777378	B2	20041014	AU 2000-43052	20000426
PT 1177216	T	20050131	PT 2000-922758	20000426
ES 2226821	T3	20050401	ES 2000-922758	20000426
NO 2001005224	A	20011025	NO 2001-5224	20011025

PRIORITY APPLN. INFO.: FR 1999-5523 A 19990430
WO 2000-FR1109 W 20000426

AB The invention relates to glucose soluble polymers which do not substantially contain any β -**glucosidic** bonds, characterized in that they comprise 2.5-10% α-1,6 glucosidic bonds, have a very low or zero tendency to retrograde in an aqueous solution determined according to a test A, possess an MP which is determined according to a test C having a median value of the distribution profile of the mol. masses ranging from 104 and 105 Daltons and have a reducing sugar content that is at most 9%. The polymers could prepared from waxy maize starch by heating and degrading with enzyme.

IC ICM C08B030-12
ICS C12P019-16

CC 44-6 (Industrial Carbohydrates)

IT **Polysaccharides, processes**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(**branched** glucose soluble polymers and method for production thereof)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L92 ANSWER 2 OF 6 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN DUPLICATE 1
ACCESSION NUMBER: 2001-042604 [06] WPIX
DOC. NO. CPI: C2001-012424
TITLE: Soluble **branched glucose** polymers with stable low viscosities useful in food compositions, e.g. as binders in instant liquid products.
DERWENT CLASS: A11 D16
INVENTOR(S): BACKER, D; **CABOCHE, J**; COMINI, S; FLECHE, G; **LOOTEN, P**; **PETITJEAN, C**; **CABOCHE, J -**; **CABOCHE, J J**
PATENT ASSIGNEE(S): (ROQF) ROQUETTE FRERES SA
COUNTRY COUNT: 93
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC

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FR 2792941      A1 20001103 (200106)*      28 C08B037-00
WO 2000066633   A1 20001109 (200106)  FR      C08B030-12
   RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL
       OA PT SD SE SL SZ TZ UG ZW
    W: AE AG AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM DZ
       EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK
       LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI
       SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
AU 2000043052   A  20001117 (200111)          C08B030-12
EP 1177216      A1 20020206 (200218)  FR      C08B030-12
    R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT
       RO SE SI
NO 2001005224   A  20011025 (200221)          C08B030-12
KR 2002010622   A  20020204 (200254)          C08B030-12
CN 1349544      A  20020515 (200260)          C08B030-12
JP 2002543248   W  20021217 (200312)       26 C08B031-00
MX 2001011078   A1 20030701 (200366)          C08B030-12
EP 1177216      B1 20040825 (200456)  FR      C08B030-12
    R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
DE 60013271     E  20040930 (200465)          C08B030-12
AU 777378       B2 20041014 (200501)          C08B030-12
ES 2226821      T3 20050401 (200524)          C08B030-12
DE 60013271     T2 20050915 (200560)          C08B030-12
MX 229525       B  20050728 (200627)          C08B030-12
CN 1197878      C  20050420 (200641)          C08B030-12
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APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
FR 2792941	A1	FR 1999-5523	19990430
WO 2000066633	A1	WO 2000-FR1109	20000426
AU 2000043052	A	AU 2000-43052	20000426
EP 1177216	A1	EP 2000-922758	20000426
		WO 2000-FR1109	20000426
NO 2001005224	A	WO 2000-FR1109	20000426
		NO 2001-5224	20011025
KR 2002010622	A	KR 2001-713894	20011030
CN 1349544	A	CN 2000-806938	20000426
JP 2002543248	W	JP 2000-615661	20000426
		WO 2000-FR1109	20000426
MX 2001011078	A1	WO 2000-FR1109	20000426
		MX 2001-11078	20011030
EP 1177216	B1	EP 2000-922758	20000426
		WO 2000-FR1109	20000426
DE 60013271	E	DE 2000-00013271	20000426
		EP 2000-922758	20000426
		WO 2000-FR1109	20000426
AU 777378	B2	AU 2000-43052	20000426
ES 2226821	T3	EP 2000-922758	20000426
DE 60013271	T2	DE 2000-00013271	20000426
		EP 2000-922758	20000426
		WO 2000-FR1109	20000426
MX 229525	B	WO 2000-FR1109	20000426
		MX 2001-11078	20011030
CN 1197878	C	CN 2000-806938	20000426

FILING DETAILS:

PATENT NO	KIND	PATENT NO

AU 2000043052	A	Based on	WO 2000066633
EP 1177216	A1	Based on	WO 2000066633
JP 2002543248	W	Based on	WO 2000066633
MX 2001011078	A1	Based on	WO 2000066633
EP 1177216	B1	Based on	WO 2000066633
DE 60013271	E	Based on	EP 1177216
		Based on	WO 2000066633
AU 777378	B2	Previous Publ.	AU 2000043052
		Based on	WO 2000066633
ES 2226821	T3	Based on	EP 1177216
DE 60013271	T2	Based on	EP 1177216
		Based on	WO 2000066633
MX 229525	B	Based on	WO 2000066633

PRIORITY APPLN. INFO: FR 1999-5523 19990430
INT. PATENT CLASSIF.:
MAIN: C08B030-12; C08B031-00; C08B037-00
SECONDARY: A23L001-09; C12N009-10; C12P019-04; C12P019-16
INDEX: C12N009-10, C12R001:89
BASIC ABSTRACT:
FR 2792941 A UPAB: 20010126
NOVELTY - Soluble **branched glucose** polymers (I) with no beta -glucoside linkages, 4-6.5% alpha -1,6-glucoside linkages, little or no tendency to undergo retrogradation in aqueous solution, a viscosity of 200-5000 cP and a molecular weight of 100,000-500000000, are new.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) production (II) of (I) by heating an aqueous suspension containing at least 2 (preferably 2-5) % by weight (weight%) starch or a starch derivative at a temperature above 130 deg. C (preferably 140-150 deg. C) and a pressure above 3.5 bar (preferably 4-5 bar) for at least 2 minutes (preferably 2-5 minutes) and treating the product with 500-2000 units of a purified **branching** enzyme at 25-40 deg. C (preferably 30 deg. C) for 10 minutes to 20 hours; and

(2) compositions containing (I) for use in the food industry.

USE - (I) are useful in food compositions, e.g. as binders in instant liquid products, including refrigerated and frozen products.

ADVANTAGE - Aqueous solutions of (I) have a stable low viscosity and good freeze-thaw stability.

Dwg.0/0
FILE SEGMENT: CPI
FIELD AVAILABILITY: AB
MANUAL CODES: CPI: A03-A00A; A10-E; A12-W09; D03-H01Q; D03-H01R; D05-A02; D05-A04; D05-C08; D05-H08
TECH UPTX: 20010126
TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred **Branching** Enzyme: This is a glycogen or starch **branching** enzyme derived from a plant, yeast, bacterium or unicellular alga, especially a genetically modified unicellular alga.
Preparation: (I) is prepared by (II).

L92 ANSWER 3 OF 6 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN
ACCESSION NUMBER: 2005-470151 [48] WPIX
DOC. NO. CPI: C2005-143441
TITLE: New highly **branched**, soluble **glucose** polymers, useful, e.g. as energy sources in foods and for peritoneal dialysis, comprise specific distribution of **branched** chain lengths.
DERWENT CLASS: A11 A96 B04 D13 D16 P34

INVENTOR(S): FUERTES, P; **PETIT JEAN, C**; ROTURIER, J; **PETITJEAN, C**; REILAND, C E P; ROTURIER, J M; KOTURIER, J

PATENT ASSIGNEE(S): (ROQF) ROQUETTE FRERES SA; (FUER-I) FUERTES P; (PETI-I) PETITJEAN C; (ROTU-I) ROTURIER J

COUNTRY COUNT: 44

PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
FR 2864088	A1	20050624	(200548)*		38	C08B037-00
CA 2491278	A1	20050619	(200548)	FR		C12P019-22
EP 1548033	A2	20050629	(200548)	FR		C08B030-12
R: AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK NL PL PT RO SE SI SK TR YU						
NO 2004005555	A	20050620	(200548)			C08B031-00
US 2005159329	A1	20050721	(200548)			C11D003-00
AU 2004240206	A1	20050707	(200551)			C08B030-18
JP 2005213496	A	20050811	(200553)		51	C08B030-18
CN 1654480	A	20050817	(200572)			C08B037-00
MX 2004012979	A1	20051001	(200620)			C07H021-02
KR 2005062462	A	20050623	(200641)			C08B037-00

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
FR 2864088	A1	FR 2003-15085	20031219
CA 2491278	A1	CA 2004-2491278	20041217
EP 1548033	A2	EP 2004-293056	20041220
NO 2004005555	A	NO 2004-5555	20041220
US 2005159329	A1	US 2004-15640	20041220
AU 2004240206	A1	AU 2004-240206	20041220
JP 2005213496	A	JP 2004-367217	20041220
CN 1654480	A	CN 2004-10103262	20041220
MX 2004012979	A1	MX 2004-12979	20041217
KR 2005062462	A	KR 2004-108970	20041220

PRIORITY APPLN. INFO: FR 2003-15085 20031219

INT. PATENT CLASSIF.:

MAIN: C07H021-02; C08B030-12; C08B030-18; C08B031-00; C08B037-00; C11D003-00; C12P019-22

SECONDARY: A23L001-09; A23L001-29; A23L001-30; A23L002-00; A61K031-715; A61K031-718; A61K031-721; A61K047-36; A61M001-28; A61P003-00; A61P003-10; C08B030-20; C08B035-00; C12P019-16; C13K001-06

BASIC ABSTRACT:

FR 2864088 A UPAB: 20060629

NOVELTY - Highly **branched**, soluble **glucose** polymers (I), comprising below 1 % reducing sugars; 13-17 % alpha -1,6 glucosidic links; molecular weight 0.9-1.5 multiply 105 D; and are characterized by the following distribution of **branched** chain length (expressed as degree of polymerization, DP): 70-85 % below DP15; 10-16 % DP15-25; and 8-13 % over DP25, are new.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for producing (I) by enzymatic treatment of an aqueous starch solution.

USE - (I) are useful in foods and particularly medical products, especially as energy sources, during physical exercise; in peritoneal dialysis; for (par)enteral nutrition; in blood plasma substitutes; for

regulation of digestion and in diabetic foods.
ADVANTAGE - (I) form compact and dense structures; have better resistance to enzymatic hydrolysis than maltodextrins (comparable with that of glycogen), and provide slow release of **glucose**.
Dwg.0/0

FILE SEGMENT: CPI GMPI
FIELD AVAILABILITY: AB; DCN
MANUAL CODES: CPI: A03-A00A; A12-V; A12-W09; B10-A07A; B14-E10; B14-E11; B14-F11; D03-H01; D05-A02C
TECH UPTX: 20050728
TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Materials: (I) has intrinsic coefficient of viscosity (a in the Mark-Houwink-Sakurada equation) of 0.1 or less; contains 14-16 % of DP 15-25 and 12-14 or 10-12 % of DP over 25.
Preparation: An aqueous solution of starch (of at least 30, preferably 35-80, wt.% amylose content) is (a) treated with a **branching** enzyme, especially at 0.04-0.15 MU per 100 g starch, at 25-80 degrees centigrade for 7-24, especially 18-24, hours; (b) treatment with a beta-amylase, preferably 0.05-0.5 % per 100 g starch, at about 60 degrees centigrade and pH 4.9-5 for 1-3, preferably 2, hours; and (c) fractionation to recover the high molecular weight products. The preferred starting starch is standard pea starch (30-40 % amylose) or starches with 40-60 %, or 60-80 %, amylose content.

L92 ANSWER 4 OF 6 FROSTI COPYRIGHT 2006 LFRA on STN
ACCESSION NUMBER: 672155 FROSTI
TITLE: Highly **branched** soluble **glucose** polymers.
INVENTOR: Fuertes P.; Roturier J.-M.; **Petitjean C.**
PATENT ASSIGNEE: Roquette Freres
SOURCE: European Patent Application
PATENT INFORMATION: EP 1548033 A2
APPLICATION INFORMATION: 20041220
PRIORITY INFORMATION: France 20031219
DOCUMENT TYPE: Patent
LANGUAGE: German
SUMMARY LANGUAGE: German
ABSTRACT: This disclosure concerns the production of a highly **branched** soluble **glucose** polymer for use in the food industry or in medical applications. The invention concerns the equalisation of the soluble glucose polymer with a weak intrinsic viscosity.
SUBJECT HEADING: ADDITIVES
CONTROLLED TERM: CARBOHYDRATES; EUROPEAN PATENT; GLUCOSE; GLUCOSE POLYMERS; PATENT; REDUCTION; RHEOLOGICAL PROPERTIES; SENSORY PROPERTIES; SUGARS; VISCOSITY
DATA ENTRY DATE: 22 Jul 2005

L92 ANSWER 5 OF 6 FROSTI COPYRIGHT 2006 LFRA on STN
ACCESSION NUMBER: 576972 FROSTI
TITLE: **Branched glucose** soluble polymers and method for the production thereof.
INVENTOR: **Caboche J.-J.**; **Looten P.**; **Petitjean C.**; Fleche G.; Comini S.; Backer D.
PATENT ASSIGNEE: Roquette Freres
SOURCE: European Patent Application
PATENT INFORMATION: EP 1177216 A1

WO 2000066633 20001109
APPLICATION INFORMATION: 20000426
PRIORITY INFORMATION: France 19990430
DOCUMENT TYPE: Patent
LANGUAGE: French
SUMMARY LANGUAGE: French
ABSTRACT: Soluble **branched glucose** polymers are described, along with a method of production. The polymers of the invention contain between 2.5% and 10% alpha-1,6-glucosidic bonds and few or no beta-glucosidic bonds, tend not to retrograde in aqueous solution, have molecular masses ranging between 104 and 105 Daltons, and have a reducing sugar content of no more than 9%. These polymers may be used in the food industry in place of starch.
SUBJECT HEADING: ADDITIVES
CONTROLLED TERM: **BRANCHED GLUCOSE** POLYMERS; EUROPEAN PATENT; GLUCOSE POLYMERS; GLUCOSE PRODUCTS; PATENT; SOLUBLE GLUCOSE POLYMERS; STARCH SUBSTITUTES
DATA ENTRY DATE: 12 Mar 2002

L92 ANSWER 6 OF 6 FROSTI COPYRIGHT 2006 LFRA on STN
ACCESSION NUMBER: 543149 FROSTI
TITLE: **Branched glucose** soluble polymers and method for the production thereof.
INVENTOR: **Caboche J.-J.**; **Looten P.**; **Petitjean C.**; Fleche G.; Comini S.; Backer D.
PATENT ASSIGNEE: Roquette Freres
SOURCE: PCT Patent Application
PATENT INFORMATION: WO 2000066633 A1
APPLICATION INFORMATION: 20000426
PRIORITY INFORMATION: France 19990430
DOCUMENT TYPE: Patent
LANGUAGE: French
SUMMARY LANGUAGE: French
ABSTRACT: Soluble **branched glucose** polymers are described, along with a method of production. The polymers of the invention contain between 2.5% and 10% alpha-1,6-glucosidic bonds and few or no beta-glucosidic bonds, tend not to retrograde in aqueous solution, have molecular masses ranging between 104 and 105 Daltons, and have a reducing sugar content of no more than 9%. These polymers may be used in the food industry in place of starch.
SUBJECT HEADING: ADDITIVES
CONTROLLED TERM: **BRANCHED GLUCOSE** POLYMERS; GLUCOSE POLYMERS; GLUCOSE PRODUCTS; PATENT; PCT PATENT; SOLUBLE GLUCOSE POLYMERS; STARCH SUBSTITUTES
DATA ENTRY DATE: 25 Jan 2001

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=>
=> => fil AGRICOLA, FROSTI, CABA, BIOTECHNO, BIOTECHDS, FSTA
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=> d que l81; d que l85; d que l89

L70      219903 SEA GLUCOSE
L71       67504 SEA POLYSACCHARIDE# OR POLY SACCHARIDE#
L72       93017 SEA BRANCH?
L75        1229 SEA BETA GLUCOSID? NOT BETA GLUCOSIDASE
L80         706 SEA (L70 OR L71)(5A) L72
L81           3 SEA L80 AND L75


L70      219903 SEA GLUCOSE
L71       67504 SEA POLYSACCHARIDE# OR POLY SACCHARIDE#
L72       93017 SEA BRANCH?
L77      750311 SEA TEMP?
L78      171195 SEA PRESSURE OR MMHG
L80         706 SEA (L70 OR L71)(5A) L72
L85           3 SEA L80 AND L77 AND L78


L70      219903 SEA GLUCOSE
L71       67504 SEA POLYSACCHARIDE# OR POLY SACCHARIDE#
L72       93017 SEA BRANCH?
L73      189990 SEA SOLUBLE
L74      952013 SEA ENZYM?
L76      120890 SEA STARCH
L77      750311 SEA TEMP?
L78      171195 SEA PRESSURE OR MMHG
L80         706 SEA (L70 OR L71)(5A) L72
L87          71 SEA L80(8A)(PREP? OR PROD? OR MANUF? OR PROCESS?)
L89          18 SEA L87 AND L74 AND (L73 OR L76 OR L77 OR L78)


=> s l81,l85,l89 not l79

L93          19 (L81 OR L85 OR L89) NOT L79

=> fil wpix; d que l53; d que l64; d que l65; d que l66
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text search

(6) previously printed with inventor search

FILE 'WPIX' ENTERED AT 16:32:53 ON 12 JUL 2006

FILE LAST UPDATED: 11 JUL 2006 <20060711/UP>
MOST RECENT DERWENT UPDATE: 200644 <200644/DW>
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http://www.stn-international.de/stndatabases/details/ipc_reform.html and
http://scientific.thomson.com/media/scpdf/ipcrdwpi.pdf <<<

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'BI ABEX' IS DEFAULT SEARCH FIELD FOR 'WPIX' FILE

L41	39530	SEA FILE=WPIX ABB=ON	GLUCOSE/BI,ABEX
L42	23051	SEA FILE=WPIX ABB=ON	POLYSACCHARIDE#/BI,ABEX OR POLY SACCHARIDE#/BI,ABEX
L43	166299	SEA FILE=WPIX ABB=ON	BRANCH?/BI,ABEX
L46	137	SEA FILE=WPIX ABB=ON	BETA GLUCOSID?/BI,ABEX NOT BETA GLUCOSIDASE/BI,ABEX
L52	226	SEA FILE=WPIX ABB=ON	(L41 OR L42)(5A)L43
L53	1	SEA FILE=WPIX ABB=ON	L52 AND L46

L41	39530	SEA FILE=WPIX ABB=ON	GLUCOSE/BI,ABEX
L42	23051	SEA FILE=WPIX ABB=ON	POLYSACCHARIDE#/BI,ABEX OR POLY SACCHARIDE#/BI,ABEX
L43	166299	SEA FILE=WPIX ABB=ON	BRANCH?/BI,ABEX
L45	100818	SEA FILE=WPIX ABB=ON	ENZYM?/BI,ABEX
L46	137	SEA FILE=WPIX ABB=ON	BETA GLUCOSID?/BI,ABEX NOT BETA GLUCOSIDASE/BI,ABEX
L57	1189	SEA FILE=WPIX ABB=ON	C08B030/IPC
L58	1538	SEA FILE=WPIX ABB=ON	C08B031/IPC
L59	9211	SEA FILE=WPIX ABB=ON	C08B037/IPC
L60	37694	SEA FILE=WPIX ABB=ON	C12N009/IPC
L61	517	SEA FILE=WPIX ABB=ON	(L41 OR L42 OR L57 OR L58 OR L59) AND L43 AND (L60 OR L45)
L64	2	SEA FILE=WPIX ABB=ON	L46 AND L61

L41	39530	SEA FILE=WPIX ABB=ON	GLUCOSE/BI,ABEX
L42	23051	SEA FILE=WPIX ABB=ON	POLYSACCHARIDE#/BI,ABEX OR POLY SACCHARIDE#/BI,ABEX
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L44	234394	SEA FILE=WPIX ABB=ON	SOLUBLE/BI,ABEX
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L58	1538	SEA FILE=WPIX ABB=ON	C08B031/IPC
L59	9211	SEA FILE=WPIX ABB=ON	C08B037/IPC

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L63           11 SEA FILE=WPIX ABB=ON  (L41 OR L42)(5A)L43 AND (L57 OR L58 OR
                 L59) AND L60
L65            5 SEA FILE=WPIX ABB=ON  L63 AND L44
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L42        23051 SEA FILE=WPIX ABB=ON  POLYSACCHARIDE#/BI,ABEX OR POLY SACCHARID
                 E#/BI,ABEX
L43       166299 SEA FILE=WPIX ABB=ON  BRANCH?/BI,ABEX
L48      1361879 SEA FILE=WPIX ABB=ON  TEMP?/BI,ABEX
L49      1097310 SEA FILE=WPIX ABB=ON  PRESSURE/BI,ABEX
L50         8149 SEA FILE=WPIX ABB=ON  MMHG/BI,ABEX
L57         1189 SEA FILE=WPIX ABB=ON  C08B030/IPC
L58         1538 SEA FILE=WPIX ABB=ON  C08B031/IPC
L59         9211 SEA FILE=WPIX ABB=ON  C08B037/IPC
L60        37694 SEA FILE=WPIX ABB=ON  C12N009/IPC
L63           11 SEA FILE=WPIX ABB=ON  (L41 OR L42)(5A)L43 AND (L57 OR L58 OR
                 L59) AND L60
L66            3 SEA FILE=WPIX ABB=ON  L63 AND (L48 OR L49 OR L50)
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=> s l53,l64,l65,l66 not l90
L94            7 (L53 OR L64 OR L65 OR L66) NOT L90
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previously printed

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=> fil capl; d que l16; d que l17; d que l22; d que l31; d que l32; d que l36

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L6         55147 SEA FILE=CAPLUS ABB=ON  POLYSACCHARIDES/CT
L7           289 SEA FILE=CAPLUS ABB=ON  L6(L)BRANCH?/OBI
L8           107 SEA FILE=CAPLUS ABB=ON  L7(L)(PEP OR PREP)/RL
L13            1 SEA FILE=REGISTRY ABB=ON  STARCH/CN
L14        79711 SEA FILE=CAPLUS ABB=ON  L13
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— Roles
PEP - physical, engineering, or chemical process
PREP - preparation

```
L16           5 SEA FILE=CAPLUS ABB=ON  L8 AND L14


L6        55147 SEA FILE=CAPLUS ABB=ON  POLYSACCHARIDES/CT
L7          289 SEA FILE=CAPLUS ABB=ON  L6(L)BRANCH?/OBI
L9          182 SEA FILE=CAPLUS ABB=ON  (BETA GLUCOSIDIC)/BI
L17           2 SEA FILE=CAPLUS ABB=ON  L7 AND L9


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L7          289 SEA FILE=CAPLUS ABB=ON  L6(L)BRANCH?/OBI
L13           1 SEA FILE=REGISTRY ABB=ON  STARCH/CN
L14       79711 SEA FILE=CAPLUS ABB=ON  L13
L20      556491 SEA FILE=CAPLUS ABB=ON  ENZYM?/OBI
L22           8 SEA FILE=CAPLUS ABB=ON  L7 AND L20 AND L14


L18       11179 SEA FILE=CAPLUS ABB=ON  (BETA GLUCOSID?)/BI
L23      221048 SEA FILE=CAPLUS ABB=ON  GLUCOSE/OBI
L24         310 SEA FILE=CAPLUS ABB=ON  L23(L)BRANCH?/OBI
L28          47 SEA FILE=CAPLUS ABB=ON  L24(L)(PEP OR PREP)/RL
L31           1 SEA FILE=CAPLUS ABB=ON  L28 AND L18


L13           1 SEA FILE=REGISTRY ABB=ON  STARCH/CN
L14       79711 SEA FILE=CAPLUS ABB=ON  L13
L20      556491 SEA FILE=CAPLUS ABB=ON  ENZYM?/OBI
L23      221048 SEA FILE=CAPLUS ABB=ON  GLUCOSE/OBI
L24         310 SEA FILE=CAPLUS ABB=ON  L23(L)BRANCH?/OBI
L28          47 SEA FILE=CAPLUS ABB=ON  L24(L)(PEP OR PREP)/RL
L32           6 SEA FILE=CAPLUS ABB=ON  L28 AND L14 AND L20


L6        55147 SEA FILE=CAPLUS ABB=ON  POLYSACCHARIDES/CT
L7          289 SEA FILE=CAPLUS ABB=ON  L6(L)BRANCH?/OBI
L8          107 SEA FILE=CAPLUS ABB=ON  L7(L)(PEP OR PREP)/RL
L20      556491 SEA FILE=CAPLUS ABB=ON  ENZYM?/OBI
L23      221048 SEA FILE=CAPLUS ABB=ON  GLUCOSE/OBI
L24         310 SEA FILE=CAPLUS ABB=ON  L23(L)BRANCH?/OBI
L28          47 SEA FILE=CAPLUS ABB=ON  L24(L)(PEP OR PREP)/RL
L33     1183078 SEA FILE=CAPLUS ABB=ON  (PRESSURE OR MHG)/BI
L34     3614925 SEA FILE=CAPLUS ABB=ON  TEMP?/BI
L35          18 SEA FILE=CAPLUS ABB=ON  (L8 OR L28) AND (L33 OR L34)
L36           4 SEA FILE=CAPLUS ABB=ON  L35 AND L20

=> s l16,l17,l22,l31,l32,l36 not l91

L95          15 (L16 OR L17 OR L22 OR L31 OR L32 OR L36) NOT L91

=> => dup rem l95,l94,l93
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PROCESSING COMPLETED FOR L95
PROCESSING COMPLETED FOR L94
PROCESSING COMPLETED FOR L93
L96 37 DUP REM L95 L94 L93 (4 DUPLICATES REMOVED)
ANSWERS '1-15' FROM FILE CAPLUS
ANSWERS '16-22' FROM FILE WPIX
ANSWERS '23-24' FROM FILE AGRICOLA
ANSWERS '25-28' FROM FILE FROSTI
ANSWER '29' FROM FILE CABA
ANSWERS '30-37' FROM FILE BIOTECHDS

=> d ibib ed abs hitind 1-15; d iall abeq tech 16-22; d iall 23-37; fil hom

L96 ANSWER 1 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 2
ACCESSION NUMBER: 1997:508765 CAPLUS
DOCUMENT NUMBER: 127:148409
TITLE: Manufacture of α-1,6-glucosidase with Bacillus and manufacture of glucosyl-(α-1,6)-branched sugar with the **enzyme**
INVENTOR(S): Kobayashi, Shoichi; Tsuzuki, Wakako; Yamamoto, Kazuki; Watanabe, Noriyasu; Yokoe, Masaaki; Oya, Ryuichi
PATENT ASSIGNEE(S): Japan Ministry of Agriculture and Forestry, Food Research Institute, Japan; Amano Pharmaceutical Co., Ltd.
SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 09191876	A2	19970729	JP 1996-25783	19960118
JP 2987685	B2	19991206		
PRIORITY APPLN. INFO.:			JP 1996-25783	19960118

ED Entered STN: 11 Aug 1997
AB α-1,6-Glucosidase, which shows optimal pH 6.5, optimal **temp** . 45°, and stability at ≤50° and is inhibited by Tris buffer, is manufactured by cultivating Bacillus, preferably Bacillus sp KW-14 (FERM P-15314) and Bacillus sp. KW-17 (FERM P-15315). Glucosyl-(α-1,6)-branched sugars are manufactured by treatment of a mixture of glucose and carbohydrates with the above enzyme. Bacillus sp. KW-17

was cultured in a liquid medium containing polypeptone, NH4Cl, MgSO4, G1-α-cyclodextrin (G1-α-CD). The culture supernatant was partially purified and the enzyme fraction was incubated with glucose and α-CD in a phosphate buffer at 45° for 3 days to give 16% G1-α-CD.

IC ICM C12N009-44
ICS C12P019-16; C12N001-00; C12N009-44; C12R001-07

CC 16-5 (Fermentation and Bioindustrial Chemistry)
Section cross-reference(s): 7, 10

IT **Polysaccharides, reactions**
RL: RCT (Reactant); RACT (Reactant or reagent)
(hydrolyzates; manufacture of α-1,6-glucosidase with Bacillus and manufacture of glucosyl-(α-1,6)- **branched** sugar from glucose and carbohydrates with the **enzyme**)

IT Carbohydrates, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(manufacture of α-1,6-glucosidase with Bacillus and manufacture of glucosyl-(α-1,6)-branched sugar from glucose and carbohydrates with the **enzyme**)

IT Bacillus (bacterium genus)
Fermentation
(manufacture of α-1,6-glucosidase with Bacillus and manufacture of glucosyl-(α-1,6)-branched sugar with the **enzyme**)

IT 37288-48-5P, α-1,6-Glucosidase
RL: BAC (Biological activity or effector, except adverse); BMF (Bioindustrial manufacture); BPN (Biosynthetic preparation); BSU (Biological study, unclassified); CAT (Catalyst use); PUR (Purification or recovery); BIOL (Biological study); **PREP (Preparation)**; USES (Uses)
(manufacture of α-1,6-glucosidase with Bacillus and manufacture of glucosyl-(α-1,6)- **branched** sugar from **glucose** and carbohydrates with the **enzyme**)

IT 99-20-7DP, Trehalose, α-1,6-glucosyl derivs. 9004-34-6DP, Cellulose, α-1,6-glucosyl derivs., preparation 9005-82-7DP, Amylose, α-1,6-glucosyl derivs. 9057-02-7DP, Pullulan, α-1,6-glucosyl derivs. 10058-19-2P, Glucosyl-α-cyclodextrin 21291-36-1P, Theanderose 33401-87-5P, Panose 85220-53-7DP, δ-Cyclodextrin, α-1,6-glucosyl derivs. 92517-02-7P, Glucosyl-β-cyclodextrin 108202-93-3P, Diglucosyl-β-cyclodextrin
RL: BMF (Bioindustrial manufacture); BPN (Biosynthetic preparation); BIOL (Biological study); **PREP (Preparation)**
(manufacture of α-1,6-glucosidase with Bacillus and manufacture of glucosyl-(α-1,6)- **branched** sugar from **glucose** and carbohydrates with the **enzyme**)

IT 50-99-7, D-Glucose, reactions 57-50-1, reactions 63-42-3, Lactose 69-79-4, Maltose 99-20-7, Trehalose 7585-39-9, β-Cyclodextrin 9004-34-6, Cellulose, reactions 9004-54-0, Dextran, reactions **9005-25-8**, Starch, reactions 9057-02-7, Pullulan 10016-20-3, α-Cyclodextrin 12619-70-4, Cyclodextrin 85220-53-7, δ-Cyclodextrin
RL: RCT (Reactant); RACT (Reactant or reagent)
(manufacture of α-1,6-glucosidase with Bacillus and manufacture of glucosyl-(α-1,6)-branched sugar from glucose and carbohydrates with the **enzyme**)

L96 ANSWER 2 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2005:119967 CAPLUS
DOCUMENT NUMBER: 142:214277
TITLE: Cloning and characterization of two

β-1,3-glucanase genes from Aspergillus oryzae: exo-β-1,3-glucanase and endo-1,3-β-glucanase

INVENTOR(S): Machida, Masayuki; Sano, Motoaki; Sunagawa, Misao; Nakajima, Suguru; Abe, Takayoshi; Gomi, Katsuya; Asai, Kiyoshi; Kim, Dai-Jin; Nagasaki, Hideki; Hosoyama, Akira; Akita, Osamu; Ogasawara, Naoki; Hisahara, Akira

PATENT ASSIGNEE(S): National Institute of Advanced Industrial Science and Technology, Japan; Dokuritsu Gyosei Hojin Seihin Hyoka Gizyutsu Kiban Kiko; National Research Institute of Brewing

SOURCE: Jpn. Kokai Tokkyo Koho, 21 pp.
CODEN: JKXXAF

DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
JP 2005034146	A2	20050210	JP 2004-188849		20040625
US 2005287634	A1	20051229	US 2005-85185		20050322
PRIORITY APPLN. INFO.:			JP 2003-183661	A	20030627
			JP 2004-188849	A	20040625

ED Entered STN: 11 Feb 2005

AB Two β-1,3-glucanases from a Aspergillus oryzae and a gene encoding the same enzyme are provided, as well as method for mass-producing the β-1,3-glucanase. Also claimed is the use for producing low mol. weight β-1,3-glucan and use as food. A β-1,3-glucanase from the Aspergillus oryzae decomps. β-glucan. Two β-1,3-glucanases genes, coding for exo and endo-1,3-β-glucanase, from a shoyu koji mold Aspergillus oryzae RIB40 (ATCC42149), were cloned and characterized. The 62kD exo-β-1,3-glucanase gene comprised 1650 bp with two introns. The encoded protein showed the highest homol. (42.4%) with Schizosaccharomyces pombe ExgH protein (ACCESSION Q10444) and was considered to be AoexgH gene. The 80 kDa endo-1,3-β-glucanase gene comprised 2211 bp with 3 introns. The protein showed the highest homol. (74%) with Aspergillus fumigatus EngL1 protein and was assigned to be AoengL gene. The endo-1,3-β-glucanase gene was overexpressed for purification and enzymic characterization. The enzyme showed a high activity toward laminarin and curdlan. For laminarin degradation, it showed a pH optimum of 5.0 and **temperature** optimum of 45 °, Km 3.62mg/mL, Vmax 75.02 μ mol/min. From the studies of the enzymic digestion of lamina oligosaccharide, it was shown to be the endo type.

IC ICM C12N015-09
ICS A23L001-28; C12N001-15; C12N001-19; C12N001-21; C12N005-10; C12N009-24; C12P019-14

CC 7-2 (Enzymes)
Section cross-reference(s): 3, 10

IT **Polysaccharides, preparation**
RL: BPN (Biosynthetic preparation); BIOL (Biological study); **PREP (Preparation)**
(**branched**, β-1,3-, low mol. weight; cloning and characterization of two β-1,3-glucanase genes from Aspergillus oryzae: exo-β-1,3-glucanases and endo-1,3-β-glucanase)

IT Aspergillus oryzae
Enzyme kinetics
Molecular cloning
Protein sequences
cDNA sequences
(cloning and characterization of two β-1,3-glucanase genes from

Aspergillus oryzae: exo-β-1,3-glucanases and endo-1,3-β-glucanase)

L96 ANSWER 3 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2005:549741 CAPLUS
DOCUMENT NUMBER: 143:61671
TITLE: Soluble polymers of highly branched glucose
INVENTOR(S): Fuertes, Patrick; Roturier, Jean Michel; Petitjean Reiland, Carole
PATENT ASSIGNEE(S): Roquette Freres, Fr.
SOURCE: Fr. Demande, 38 pp.
CODEN: FRXXBL
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
FR 2864088	A1	20050624	FR 2003-15085	20031219
FR 2864088	B1	20060428		
CA 2491278	AA	20050619	CA 2004-2491278	20041217
NO 2004005555	A	20050620	NO 2004-5555	20041220
EP 1548033	A2	20050629	EP 2004-293056	20041220
EP 1548033	A3	20051026		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU				
AU 2004240206	A1	20050707	AU 2004-240206	20041220
US 2005159329	A1	20050721	US 2004-15640	20041220
JP 2005213496	A2	20050811	JP 2004-367217	20041220
CN 1654480	A	20050817	CN 2004-10103262	20041220

PRIORITY APPLN. INFO.: FR 2003-15085 A 20031219
ED Entered STN: 24 Jun 2005
AB The invention relates to highly branched soluble polymers of glucose having a reducing sugar content lower than 1%, a content of α-1,6-glucosidic bonds 13-17% and mol. weight (0.9-1.5) + 105, characterized by the fact that the distribution profile of branch chain lengths is 70-85% of d.p. <15, 10-16% of d.p. 15-25 and 8-13% of d.p. >25. These polymers are manufactured by successive treatment of a ≥30% aqueous starch solution with a branching enzyme and then with β-amylase and fractionation of high-mol.-weight material.
IC ICM C08B037-00
ICS C12P019-22; A23L001-09
CC 44-6 (Industrial Carbohydrates)
ST branched soluble starch manuf; branching **enzyme** treatment starch aq soln; amylase treatment starch aq soln
IT Nutrition, animal
(enteral; manufacture of soluble polymers of highly branched glucose by treatment of soluble starch with branching **enzymes** and β-amylase for use in enteral nutrition)
IT Geobacillus stearothermophilus
(glycogen of, branching **enzyme**; manufacture of soluble polymers of highly branched glucose by treatment of soluble starch with branching **enzymes** and β-amylase)
IT **Enzymes**, uses
RL: CAT (Catalyst use); USES (Uses)
(manufacture of soluble polymers of highly branched glucose by treatment of soluble starch with branching **enzymes** and β-amylase)
IT Blood substitutes

(manufacture of soluble polymers of highly branched glucose by treatment of soluble starch with branching **enzymes** and β-amylase for use as blood substitutes)

IT Food
(manufacture of soluble polymers of highly branched glucose by treatment of soluble starch with branching **enzymes** and β-amylase for use as diabetic foods)

IT Digestion, biological
(manufacture of soluble polymers of highly branched glucose by treatment of soluble starch with branching **enzymes** and β-amylase for use as digestion regulators)

IT Nutrition, animal
(parenteral; manufacture of soluble polymers of highly branched glucose by treatment of soluble starch with branching **enzymes** and β-amylase for use in parenteral nutrition)

IT Dialysis
(peritoneal; manufacture of soluble polymers of highly branched glucose by treatment of soluble starch with branching **enzymes** and β-amylase for use in peritoneal dialysis)

IT 9000-91-3, Spezyme BBA
RL: CAT (Catalyst use); USES (Uses)
(manufacture of soluble polymers of highly branched glucose by treatment of soluble starch with branching **enzymes** and β-amylase)

IT **9005-25-8D**, Starch, soluble derivs.
RL: CPS (Chemical process); **PEP (Physical, engineering or chemical process)**; PROC (Process)
(manufacture of soluble polymers of highly **branched glucose** by treatment of soluble starch with **branching enzymes** and β-amylase)

IT 9005-79-2, Glycogen, uses
RL: CAT (Catalyst use); USES (Uses)
(of Bacillus stearothermophilus, branching **enzyme**; manufacture of soluble polymers of highly branched glucose by treatment of soluble starch with branching **enzymes** and β-amylase)

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L96 ANSWER 4 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2005:85377 CAPLUS
DOCUMENT NUMBER: 142:217848
TITLE: Correlating the kinetics of branched polymer synthesis with a desired characteristic of the polymer, especially starch production as related to food use.
INVENTOR(S): Castro, Jeffrey Victor; Chiou, Herbert Clark; Morell, Matthew Kennedy; Fellows, Christopher Michael; Fitzgerald, Melissa Ann; Gilbert, Robert Goulston
PATENT ASSIGNEE(S): The Minister for Agriculture, the Minister for Corrective Services for A, Australia
SOURCE: Can. Pat. Appl., 31 pp.
CODEN: CPXXEB
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CA 2408012	AA	20040415	CA 2002-2408012	20021015
PRIORITY APPLN. INFO.:			CA 2002-2408012	20021015

ED Entered STN: 01 Feb 2005

AB The present invention relates to the anal. of the structure and synthesis of branched polymers of biol. origin and the effects of these parameters on the end use of the branched polymer. In particular, the present invention relates to the correlation of the kinetics of starch production to the usefulness of a particular starch in a given food or non-food application. The methods of the present invention are capable of showing the rates of all the different enzymic processes that lead to a particular branched polymer structure. The present invention surprisingly teaches that the rate coeffs. of polymer chain propagation, termination and/or branching, as used in free radical synthetic polymer chemical, can be used for analyzing the kinetics of branched polymer synthesis in biol. systems. In one aspect, the present invention provides a method of analyzing the kinetics of branched polymer synthesis, which comprises (1) determining the absolute mol. weight distribution of individual branches of a polymer, and/or another property(ies) characterizing starch polymer microstructure, and (ii) using the absolute mol. weight distribution, and/or another property(ies) characterizing starch polymer microstructure, data obtained from step (i) to calculate the rate coefficient or rate of at least one of chain propagation, termination or branching during formation of the polymer, wherein the polymer is of biol. origin. The data obtained from this method can be used as an indicator of the kinetics of branched polymer synthesis. Polymers obtained from different biol. origins, especially different strains and/or mutants of the same species of organism and/or under different growth conditions, can be analyzed and variations in the kinetics compared between the different sources of the polymer. These branched polymers from different sources can also be tested for their suitability for various end-uses (desirable characteristics) of the branched polymer. These two factors, kinetics and suitability for a particular end-use, can then be compared to establish a correlation between the rate of at least one of chain propagation, termination or branching and suitability for a particular end use. This ultimately allows a polymer to be analyzed by the methods of the invention to ascertain suitable end-uses for the polymer without the need to conduct extensive trials on different end-uses, and/or test a polymer for a given end-use when it will clearly not be suitable for that end-use as predicted by the kinetic anal.

IC ICM G01N033-10
ICS A01H003-00; G01N015-00; G01N030-00; A01H001-04; C08B030-12; C08B030-20

CC 17-2 (Food and Feed Chemistry)

IT **Enzymes**, biological studies
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(branching; correlating the kinetics of branched polymer synthesis with a desired characteristic of the polymer, especially starch production as related to food use)

IT **Enzymes**, uses
RL: CAT (Catalyst use); USES (Uses)
(debranching **enzymes**; correlating the kinetics of branched polymer synthesis with a desired characteristic of the polymer, especially starch production as related to food use)

IT 50-99-7DP, D-**Glucose**, polymers **9005-25-8P**, Starch, biological studies 9005-82-7P, Amylose 9037-22-3P, Amylopectin
RL: FFD (Food or feed use); IMF (Industrial manufacture); PRP (Properties); BIOL (Biological study); **PREP (Preparation)**; USES (Uses)
(correlating the kinetics of **branched** polymer synthesis with a desired characteristic of the polymer, especially starch production as related to food use)

L96 ANSWER 5 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:969394 CAPLUS
DOCUMENT NUMBER: 140:19856
TITLE: Soluble highly branched glucose polymers prepared by **enzymic** modification of starch or starch derivatives
INVENTOR(S): Backer, Daniel; Saniez, Marie-Helene
PATENT ASSIGNEE(S): Roquette Freres, Fr.
SOURCE: Eur. Pat. Appl., 18 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: French
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1369432	A2	20031210	EP 2003-291325	20030603
EP 1369432	A3	20040211		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
FR 2840612	A1	20031212	FR 2002-6952	20020606
FR 2840612	B1	20050506		
US 2004014961	A1	20040122	US 2003-454225	20030604
US 6861519	B2	20050301		
CA 2430557	AA	20031206	CA 2003-2430557	20030605
JP 2004161998	A2	20040610	JP 2003-161125	20030605
CN 1468867	A	20040121	CN 2003-142428	20030606
US 2005142167	A1	20050630	US 2005-66423	20050228
PRIORITY APPLN. INFO.:			FR 2002-6952 A	20020606
			US 2003-454225 A3	20030604

ED Entered STN: 12 Dec 2003
AB Soluble highly branched glucose polymers with a reducing-sugar content of ≤1% are characterized by >10% (preferably 12-30%) α-1,6 glucosidic linkages, a mol. weight of 0.35 + 105 to 2 + 105 daltons, and an osmolality of 1-15 mOsm/kg. The glucose polymers are obtained by incubating starch or a starch derivative with a branching enzyme (e.g., Bacillus stearothermophilus glycogen-branching enzyme) and by subsequent treatment with a hydrolytic enzyme (e.g., amylase or amyloglucosidase) or α-transglucosidase. Membrane or chromatog. techniques are used to recover the high-mol.-weight fractions. The glucose polymers have particular application in enteral and parenteral nutrition, in peritoneal dialysis, as inhibitors and(or) regulators in glycemia, as an energy source for phys. activity, and a regulator of digestion. The polymers may also have application in the paper and paperboard industry, in textiles, and cosmetics.
IC ICM C08B030-18
ICS C12P019-18; A23L001-09; C08B037-00
CC 63-6 (Pharmaceuticals)
Section cross-reference(s): 17, 40, 43, 44, 62
ST glucose polymer branching **enzyme** dialysis enteral parenteral nutrient glycemia
IT **Polysaccharides, biological studies**
RL: BMF (Bioindustrial manufacture); COS (Cosmetic use); FFD (Food or feed use); NUU (Other use, unclassified); THU (Therapeutic use); BIOL (Biological study); **PREP (Preparation)**; USES (Uses)
(**branched**; soluble highly **branched glucose** polymers prepared by **enzymic** modification of starch or starch derivs.)

IT Nutrients
(enteral; soluble highly branched glucose polymers prepared by **enzymic** modification of starch or starch derivs.)
IT Nutrients
(parenteral; soluble highly branched glucose polymers prepared by **enzymic** modification of starch or starch derivs.)
IT Dialysis
(peritoneal; soluble highly branched glucose polymers prepared by **enzymic** modification of starch or starch derivs.)
IT Alcohols, biological studies
RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(polyhydric, peritoneal dialysis solution containing; soluble highly branched glucose polymers prepared by **enzymic** modification of starch or starch derivs.)
IT Hyperglycemia
Hypoglycemia
(regulator of; soluble highly branched glucose polymers prepared by **enzymic** modification of starch or starch derivs.)
IT Digestion, biological
(regulator; soluble highly branched glucose polymers prepared by **enzymic** modification of starch or starch derivs.)
IT Cosmetics
Paper
Paperboard
Size-exclusion chromatography
Textiles
Ultrafiltration
(soluble highly branched glucose polymers prepared by **enzymic** modification of starch or starch derivs.)
IT Beverages
(sports; soluble highly branched glucose polymers prepared by **enzymic** modification of starch or starch derivs.)
IT 9000-90-2, Lysase
RL: BUU (Biological use, unclassified); BIOL (Biological study); USES (Uses)
(Lysase; soluble highly branched glucose polymers prepared by **enzymic** modification of starch or starch derivs.)
IT 64-19-7, Acetic acid, biological studies
RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(peritoneal dialysis solution containing acetate buffer; soluble highly branched glucose polymers prepared by **enzymic** modification of starch or starch derivs.)
IT 526-95-4, Gluconic acid
RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(peritoneal dialysis solution containing gluconate buffer; soluble highly branched glucose polymers prepared by **enzymic** modification of starch or starch derivs.)
IT 50-21-5, Lactic acid, biological studies
RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(peritoneal dialysis solution containing lactate buffer; soluble highly branched glucose polymers prepared by **enzymic** modification of starch or starch derivs.)
IT 50-70-4, Sorbitol, biological studies 69-65-8, Mannitol 87-99-0, Xylitol 149-32-6, Erythritol 585-88-6, Maltitol
RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(peritoneal dialysis solution containing; soluble highly branched glucose polymers prepared by **enzymic** modification of starch or starch

derivs.)
IT **9005-25-8**, Corn starch, processes 9050-36-6, Glucidex 2
RL: BCP (Biochemical process); BIOL (Biological study); PROC (Process)
(soluble highly branched glucose polymers prepared by **enzymic** modification of starch or starch derivs.)
IT 9000-91-3, Spezyme BBA 9001-97-2, Starch-branching **enzyme**
9032-08-0, Optidex L300A
RL: BUU (Biological use, unclassified); BIOL (Biological study); USES (Uses)
(soluble highly branched glucose polymers prepared by **enzymic** modification of starch or starch derivs.)
IT 9001-42-7, α-Glucosidase
RL: BUU (Biological use, unclassified); BIOL (Biological study); USES (Uses)
(α-transglucosidase; soluble highly branched glucose polymers prepared by **enzymic** modification of starch or starch derivs.)

L96 ANSWER 6 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2003:600180 CAPLUS
DOCUMENT NUMBER: 139:365152
TITLE: Nonnatural branched polysaccharides: synthesis and properties of chitin and chitosan having disaccharide maltose branches
AUTHOR(S): Kurita, Keisuke; Akao, Hirofumi; Yang, Jin; Shimojoh, Manabu
CORPORATE SOURCE: Department of Applied Chemistry, Faculty of Engineering, Seikei University, Tokyo, 180-8633, Japan
SOURCE: Biomacromolecules (2003), 4(5), 1264-1268
CODEN: BOMAF6; ISSN: 1525-7797
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 139:365152
ED Entered STN: 06 Aug 2003
AB Synthesis and properties of chitin and chitosan derivs. having β-maltoside branches at C-6 have been studied. Chitosan was first transformed into an organosol. acceptor having a reactive group only at C-6, 3-O-acetyl-2-N-phthaloyl-6-O-trimethylsilylchitosan. Glycosylation with an ortho ester from D-maltose was performed successfully at room **temperature** in dichloromethane in the presence of trimethylsilyl trifluoromethanesulfonate as the catalyst. The degree of substitution could be controlled by the reaction conditions and was up to 0.56. Full deprotection gave chitosan with maltoside branches, and the subsequent N-acetylation resulted in the formation of the corresponding chitin derivative The introduced disaccharide unit improved hydrophilic properties considerably compared to monosaccharide units as confirmed by high solubility in water and moisture absorption and retention ability. The enzymic degradability and antimicrobial activity were moderate probably because of the bulky nature of the branches.
CC 33-7 (Carbohydrates)
Section cross-reference(s): 7, 10
ST maltoside branch chitin chitosan prepn; **enzymic** degrdn maltoside branch chitin chitosan; antimicrobial maltoside branch chitin chitosan
IT Decomposition
(biodegrdn.; preparation, **enzymic** degradation and antimicrobial activity of maltoside branched chitosan polysaccharides)
IT **Polysaccharides, preparation**
RL: BSU (Biological study, unclassified); PRP (Properties); SPN (Synthetic preparation); BIOL (Biological study); **PREP (Preparation)**
(**branched**; preparation, **enzymic** degradation and

antimicrobial activity of maltoside **branched** chitosan polysaccharides)

IT Antimicrobial agents
Glycosylation
(preparation, **enzymic** degradation and antimicrobial activity of maltoside branched chitosan polysaccharides)

IT 1398-61-4, Chitin
RL: BSU (Biological study, unclassified); PRP (Properties); RCT (Reactant); BIOL (Biological study); RACT (Reactant or reagent)
(preparation, **enzymic** degradation and antimicrobial activity of maltoside branched chitosan polysaccharides)

IT 622407-89-0P
RL: BSU (Biological study, unclassified); PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); BIOL (Biological study); PREP (Preparation); RACT (Reactant or reagent)
(preparation, **enzymic** degradation and antimicrobial activity of maltoside branched chitosan polysaccharides)

IT 622407-92-5P
RL: BSU (Biological study, unclassified); PRP (Properties); SPN (Synthetic preparation); BIOL (Biological study); PREP (Preparation)
(preparation, **enzymic** degradation and antimicrobial activity of maltoside branched chitosan polysaccharides)

IT 9012-76-4P, Chitosan 622407-88-9P
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation, **enzymic** degradation and antimicrobial activity of maltoside branched chitosan polysaccharides)

IT 69-79-4, D-Maltose
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation, **enzymic** degradation and antimicrobial activity of maltoside branched chitosan polysaccharides)

IT 7233-62-7P 20880-60-8P 204719-76-6P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation, **enzymic** degradation and antimicrobial activity of maltoside branched chitosan polysaccharides)

REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L96 ANSWER 7 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:61349 CAPLUS
DOCUMENT NUMBER: 138:316575
TITLE: Three isoforms of isoamylase contribute different catalytic properties for the debranching of potato glucans
AUTHOR(S): Hussain, Hasnain; Mant, Alexandra; Seale, Robert; Zeeman, Sam; Hinchliffe, Edward; Edwards, Anne; Hylton, Christopher; Bornemann, Stephen; Smith, Alison M.; Martin, Cathie; Bustos, Regla
CORPORATE SOURCE: Departments of Cell and Developmental Biology, Metabolic Biology, John Innes Centre, Norwich, NR4 7UH, UK
SOURCE: Plant Cell (2003), 15(1), 133-149
CODEN: PLCEEW; ISSN: 1040-4651
PUBLISHER: American Society of Plant Biologists
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 27 Jan 2003
AB Isoamylases are debranching enzymes that hydrolyze α-1,6 linkages in α-1,4/α-1,6-linked glucan polymers. In plants, they have been

shown to be required for the normal synthesis of amylopectin, although the precise manner in which they influence starch synthesis is still debated. CDNA clones encoding three distinct isoamylase isoforms (Stisa1, Stisa2, and Stisa3) have been identified from potato. The expression patterns of the genes are consistent with the possibility that they all play roles in starch synthesis. Anal. of the predicted sequences of the proteins suggested that only Stisa1 and Stisa3 are likely to have hydrolytic activity and that there probably are differences in substrate specificity between these two isoforms. This was confirmed by the expression of each isoamylase in Escherichia coli and characterization of its activity. Partial purification of isoamylase activity from potato tubers showed that Stisa1 and Stisa2 are associated as a multimeric enzyme but that Stisa3 is not associated with this enzyme complex. Our data suggest that Stisa1 and Stisa2 act together to debranch soluble glucan during starch synthesis. The catalytic specificity of Stisa3 is distinct from that of the multimeric enzyme, indicating that it may play a different role in starch metabolism

CC 7-2 (Enzymes)
Section cross-reference(s): 3, 11

IT **Enzyme** functional sites
(active; sequences, characterization and expression of three isoforms of potato isoamylase and their different catalytic specificities for debranching of glucans)

IT **Polysaccharides, biological studies**
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(**branched**; sequences, characterization and expression of three isoforms of potato isoamylase and their different catalytic specificities for debranching of glucans)

IT **Enzymes**, biological studies
RL: BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study)
(isoenzymes; sequences, characterization and expression of three isoforms of potato isoamylase and their different catalytic specificities for debranching of glucans)

IT **9005-25-8**, Starch, biological studies 9012-72-0, Glucan
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(sequences, characterization and expression of three isoforms of potato isoamylase and their different catalytic specificities for debranching of glucans)

REFERENCE COUNT: 55 THERE ARE 55 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L96 ANSWER 8 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2000:260548 CAPLUS
DOCUMENT NUMBER: 132:289622
TITLE: Neisseria branching **enzyme** and gene and method for producing α-1,6-branched α-1,4-glucans
INVENTOR(S): Buttcher, Volker; Quanz, Martin
PATENT ASSIGNEE(S): Planttec Biotechnologie G.m.b.H. Forschung & Entwicklung, Germany; Max-Planck-Gesellschaft Zur Forderung Der Wissenschaften E.V.
SOURCE: PCT Int. Appl., 115 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

WO 2000022140 A1 20000420 WO 1999-EP7562 19991008
W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG
DE 19846635 A1 20000511 DE 1998-19846635 19981009
DE 19924342 A1 20001130 DE 1999-19924342 19990527
CA 2345904 AA 20000420 CA 1999-2345904 19991008
AU 9964697 A1 20000501 AU 1999-64697 19991008
AU 765131 B2 20030911
BR 9915026 A 20010717 BR 1999-15026 19991008
EP 1117802 A1 20010725 EP 1999-952542 19991008
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO
JP 2002527068 T2 20020827 JP 2000-576030 19991008
US 6566585 B1 20030520 US 2000-579365 20000525
CA 2375353 AA 20001207 CA 2000-2375353 20000526
WO 2000073422 A1 20001207 WO 2000-EP4842 20000526
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG
BR 2000010989 A 20020326 BR 2000-10989 20000526
EP 1192244 A1 20020403 EP 2000-938690 20000526
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO
JP 2003501020 T2 20030114 JP 2001-500737 20000526
AU 779237 B2 20050113 AU 2000-53975 20000526
ZA 2001002854 A 20020103 ZA 2001-2854 20010406
US 6699694 B1 20040302 US 2001-807063 20010611
ZA 2001009701 A 20020621 ZA 2001-9701 20011126
US 2004110254 A1 20040610 US 2003-705195 20031110
PRIORITY APPLN. INFO.: DE 1998-19846635 A 19981009
DE 1999-19924342 A 19990527
WO 1999-EP7562 W 19991008
WO 2000-EP4842 W 20000526
US 2001-807063 A3 20010611

ED Entered STN: 21 Apr 2000

AB The invention relates to nucleic acid mols. which code a branching enzyme from a bacterium of the genus Neisseria, to vectors, host cells, plant cells and plants containing such nucleic acid mols., as well as to starch which can be obtained from said plants. The invention also relates to an in-vitro method for producing α-1,6-branched α-1,4-glucans based on saccharose and an enzyme combination comprised of an amylosucrase and of a branching enzyme. In addition, the invention relates to the α-1,6-branched α-1,4-glucans which can be obtained using the method. Thus, the branching enzyme gene of N. denitrificans was cloned and sequenced. This gene was expressed in potato plants, and, along with an amylosucrase gene, in Escherichia coli. The glucans produced in these transgenic organisms were characterized.

IC ICM C12N015-54
ICS C12N015-63; C12N001-21; C12N005-10; C12N009-10; C12P021-02; C07K016-12; A01H005-00; C08B030-00
CC 3-3 (Biochemical Genetics)
Section cross-reference(s): 7, 10, 16
ST sequence Neisseria branching **enzyme** gene; starch manuf transgenic plant cell Neisseria branching **enzyme**
IT Neisseria
Neisseria denitrificans
(Neisseria branching **enzyme** and gene and method for producing α-1,6-branched α-1,4-glucans)
IT **Polysaccharides, properties**
RL: BPN (Biosynthetic preparation); PRP (Properties); BIOL (Biological study); **PREP (Preparation)**
(**branched**; Neisseria **branching enzyme** and gene and method for producing α-1,6- **branched** α-1,4-glucans)
IT Protein sequences
(of Neisseria denitrificans branching **enzyme**)
IT DNA sequences
(of Neisseria denitrificans branching **enzyme** gene)
IT Molecular cloning
(of branching **enzyme** gene; Neisseria branching **enzyme** and gene and method for producing α-1,6-branched α-1,4-glucans)
IT Promoter (genetic element)
RL: BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)
(of branching **enzyme** gene; Neisseria branching **enzyme** and gene and method for producing α-1,6-branched α-1,4-glucans)
IT Plant cell
(recombinant, branching **enzyme** gene-expressing; Neisseria branching **enzyme** and gene and method for producing α-1,6-branched α-1,4-glucans)
IT Escherichia coli
(recombinant, glucans production with; Neisseria branching **enzyme** and gene and method for producing α-1,6-branched α-1,4-glucans)
IT Antibodies
RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)
(to branching **enzyme**; Neisseria branching **enzyme** and gene and method for producing α-1,6-branched α-1,4-glucans)
IT Plant (Embryophyta)
(transgenic, branching **enzyme** gene-expressing; Neisseria branching **enzyme** and gene and method for producing α-1,6-branched α-1,4-glucans)
IT Potato (Solanum tuberosum)
(transgenic, glucans production with; Neisseria branching **enzyme** and gene and method for producing α-1,6-branched α-1,4-glucans)
IT 9001-97-2P, e.c. 2.4.1.18
RL: BAC (Biological activity or effector, except adverse); BOC (Biological occurrence); BPN (Biosynthetic preparation); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); OCCU (Occurrence); PREP (Preparation)
(Neisseria branching **enzyme** and gene and method for producing α-1,6-branched α-1,4-glucans)
IT **9005-25-8P**, Starch, properties

RL: BPN (Biosynthetic preparation); PRP (Properties); BIOL (Biological study); PREP (Preparation)
(Neisseria branching **enzyme** and gene and method for producing α-1,6-branched α-1,4-glucans)

IT 246229-73-2P, Glycosyltransferase, α-glucan-branching (Neisseria denitrificans clone pBB48)
RL: BAC (Biological activity or effector, except adverse); BOC (Biological occurrence); BPN (Biosynthetic preparation); BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study); OCCU (Occurrence); PREP (Preparation)
(amino acid sequence; Neisseria branching **enzyme** and gene and method for producing α-1,6-branched α-1,4-glucans)

IT 57-50-1, biological studies
RL: BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)
(branched glucans manufacture from; Neisseria branching **enzyme** and gene and method for producing α-1,6-branched α-1,4-glucans)

IT 9032-11-5, Amylosucrase
RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); BIOL (Biological study)
(branched glucans manufacture with branching **enzyme** and; Neisseria branching **enzyme** and gene and method for producing α-1,6-branched α-1,4-glucans)

IT 244610-98-8, DNA (Neisseria denitrificans clone pBB48 α-glucan branching glycosyltransferase gene plus flanks) 263887-01-0
RL: BUU (Biological use, unclassified); PRP (Properties); BIOL (Biological study); USES (Uses)
(nucleotide sequence; Neisseria branching **enzyme** and gene and method for producing α-1,6-branched α-1,4-glucans)

IT 264246-89-1, 3: PN: WO0022140 SEQID: 4 unclaimed DNA 264246-90-4, 5: PN: WO0022140 SEQID: 6 unclaimed DNA 264246-91-5, 6: PN: WO0022140 SEQID: 7 unclaimed DNA
RL: PRP (Properties)
(unclaimed nucleotide sequence; neisseria branching **enzyme** and gene and method for producing α-1,6-branched α-1,4-glucans)

IT 221650-68-6 264261-72-5
RL: PRP (Properties)
(unclaimed protein sequence; neisseria branching **enzyme** and gene and method for producing α-1,6-branched α-1,4-glucans)

IT 264196-44-3 264196-46-5 264196-48-7 264196-50-1 264196-52-3
264196-54-5 264196-55-6 264196-57-8 264196-59-0 264196-60-3
264196-62-5 264196-64-7 264196-66-9 264196-68-1 264196-69-2
264196-70-5 264196-71-6 264196-72-7 264196-73-8 264196-74-9
264196-75-0 264196-76-1 264196-77-2 264196-78-3 264196-79-4
264196-80-7 264196-81-8
RL: PRP (Properties)
(unclaimed sequence; neisseria branching **enzyme** and gene and method for producing α-1,6-branched α-1,4-glucans)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L96 ANSWER 9 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2000:817136 CAPLUS
DOCUMENT NUMBER: 133:331188
TITLE: Cyclic glucan synthesis with thermostable branching **enzyme** for use in food production
INVENTOR(S): Takada, Hiroki; Takabane, Takeshi; Kuriki, Takashi; Okada, Shigetaka
PATENT ASSIGNEE(S): Ezaki Glico Co., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000316581	A2	20001121	JP 1999-130833	19990512
PRIORITY APPLN. INFO.:			JP 1999-130833	19990512

ED Entered STN: 21 Nov 2000

AB Synthesis of cyclic glucans by cyclization of α-glucans with thermostable branching enzyme (EC 2.4.1.18) for use in food processing/manufacturing, is disclosed. The enzyme is derived from super thermophilic bacteria of Thermotogales or Aquificales genus, such as Aquifex aeolicus VF5, Aquifex pyrophilus DSM6858, or Thermotoga maritima MSB8. It is used for manufacturing of rice, Japanese confectionery, snacks, baked food, noodle, dumpling wrap, seafood paste, frozen food, weaning food, baby food, animal feed, drinks, sports food, or nutritional supplement. Food material, food additive, or food modifier containing the thermostable branching enzyme, are claimed. Aquifex aeolicus VF5 branching enzyme gene was synthesized and recombinantly expressed in E. coli. Activity of the enzyme on amylose to produce α-1,6-glucosidic linkages at 70C was confirmed. Production of cyclic glucans and application in food processing, modification of starch characteristics in rice cake production, were demonstrated.

IC ICM C12N015-09
ICS A23L001-00; C12N009-10; C12P019-18; C12N001-21; C12R001-01

CC 6-4 (General Biochemistry)
Section cross-reference(s): 7, 17

ST cyclization amylose glucan thermostable branching **enzyme**; food processing manufg Aquifex Thermotoga branching **enzyme**

IT Confectionery
(Japanese; cyclic glucan synthesis with thermostable branching **enzyme** for use in food production)

IT **Polysaccharides, biological studies**
RL: BPN (Biosynthetic preparation); BPR (Biological process); BSU (Biological study, unclassified); MFM (Metabolic formation); BIOL (Biological study); FORM (Formation, nonpreparative); **PREP (Preparation)**; PROC (Process)
(**branched**; cyclic glucan synthesis with thermostable **branching enzyme** for use in food production)

IT Aquifex aeolicus
Aquifex pyrophilus
Aquificales
Bakery products
Beverages
Feed
Food additives
Food processing
Frozen foods
Pasta
Rice (Oryza sativa)
Thermophilic bacteria
Thermotoga maritima
Thermotogales
(cyclic glucan synthesis with thermostable branching **enzyme** for use in food production)

IT Bakery products

(dumplings, wrap; cyclic glucan synthesis with thermostable branching **enzyme** for use in food production)
IT Cyclization
(**enzymic**; cyclic glucan synthesis with thermostable branching **enzyme** for use in food production)
IT Rice (Oryza sativa)
(glutinous rice cake; cyclic glucan synthesis with thermostable branching **enzyme** for use in food production)
IT Food
(infant; cyclic glucan synthesis with thermostable branching **enzyme** for use in food production)
IT Fish
(paste; cyclic glucan synthesis with thermostable branching **enzyme** for use in food production)
IT Food
(snack; cyclic glucan synthesis with thermostable branching **enzyme** for use in food production)
IT Diet
(supplements; cyclic glucan synthesis with thermostable branching **enzyme** for use in food production)
IT 9001-97-2P, Branching **enzyme** 204793-22-6P
RL: BPN (Biosynthetic preparation); CAT (Catalyst use); BIOL (Biological study); PREP (Preparation); USES (Uses)
(cyclic glucan synthesis with thermostable branching **enzyme** for use in food production)
IT **9005-25-8**, Starch, biological studies 9005-82-7, Amylose
RL: BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)
(cyclic glucan synthesis with thermostable branching **enzyme** for use in food production)

L96 ANSWER 10 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 2000:54222 CAPLUS
DOCUMENT NUMBER: 132:94908
TITLE: Manufacture of spherical microparticles containing water-insoluble, branched polyglucan
INVENTOR(S): Bengs, Holger; Grande, Juergen
PATENT ASSIGNEE(S): Aventis Research and Technologies GmbH and Co. KG, Germany
SOURCE: Ger., 10 pp.
CODEN: GWXXAW
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 19839216	C1	20000120	DE 1998-19839216	19980828
CA 2340222	AA	20000309	CA 1999-2340222	19990814
WO 2000012590	A1	20000309	WO 1999-EP5976	19990814
W: AU, CA, CN, CZ, HU, JP, KR, NO, NZ, PL, US, ZA				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
AU 9958521	A1	20000321	AU 1999-58521	19990814
EP 1123342	A1	20010816	EP 1999-945981	19990814
EP 1123342	B1	20031105		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
JP 2002523584	T2	20020730	JP 2000-567599	19990814

AT 253613	E	20031115	AT 1999-945981		19990814
US 6562459	B1	20030513	US 2001-786142		20010607
PRIORITY APPLN. INFO.:			DE 1998-19839216	A	19980828
			WO 1999-EP5976	W	19990814

ED Entered STN: 23 Jan 2000

AB The title particles, useful for chromatog. sepns., in diagnostic testing and as filler for polymers, are manufactured by dissolving a H2O-insol. polyglucan having degree of branching ≤8% or a mixture of a linear and branched polyglucan (≤30% of the latter based on total polysaccharides) in a solvent or mixture of solvents and precipitating the particles by pouring the solution into a cooled precipitant, e.g., H2O or DMSO. A suitable branched polysaccharide is α-amylase-resistant polyglucan and a suitable H2O-insol. linear polysaccharides are poly(1,4-α-D-glucan) and poly(1,3-β-D-glucan) or their derivs. For example, Hylon VII was stirred with DMSO, the solution separated by centrifugation, precipitated with BuOH, the precipitate dissolved in boiling H2O and repptd. with BuOH to give amylose-enriched starch. This (1.0 g) was dissolved in 5 mL DMSO at 60°, the solution added dropwise with stirring to 100 mL H2O, the precipitate separated by centrifugation and washed to give the title particles.

IC ICM C08L005-00
ICS C08J003-14; C08L003-00; B01D015-08; A61K009-16; C08B037-00

CC 44-4 (Industrial Carbohydrates)

IT **Polysaccharides, processes**
RL: **PEP (Physical, engineering or chemical process)**; TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of spherical microparticles containing water-insol., **branched** polyglucan)

IT **9005-25-8D**, Starch, amylose-enriched, processes 9051-97-2, 1,3-β-D-Glucan
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(manufacture of spherical microparticles containing water-insol., branched polyglucan)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L96 ANSWER 11 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER:	1998:488646 CAPLUS
DOCUMENT NUMBER:	129:199690
TITLE:	Phosphorylated α(1→4)glucans as substrate for potato starch-branching **enzyme** I
AUTHOR(S):	Vikso-Nielsen, Anders; Blennow, Andreas; Nielsen, Tom Hamborg; Moller, Birger Lindberg
CORPORATE SOURCE:	Dep. Plant Biol., Royal Vet. Agric. Univ., Copenhagen, DK-1871, Den.
SOURCE:	Plant Physiology (1998), 117(3), 869-875 CODEN: PLPHAY; ISSN: 0032-0889
PUBLISHER:	American Society of Plant Physiologists
DOCUMENT TYPE:	Journal
LANGUAGE:	English

ED Entered STN: 06 Aug 1998

AB The possible involvement of potato (Solanum tuberosum) starch-branching enzyme I (PSBE-I) in the in vivo synthesis of phosphorylated amylopectin was investigated in in vitro expts. with isolated PSBE-I using 33P-labeled phosphorylated and 3H end-label nonphosphorylated α(1→4)glucans as the substrates. From these radiolabeled substrates PSBE-I was shown to catalyze the formation of dual-labeled (3H/33P) phosphorylated branched polysaccharides with an average d.p. of 80 to

85. The relatively high mol. mass indicated that the product was the result of multiple chain-transfer reactions. The presence α(1→6) branch points was documented by isoamylase treatment and anion-exchange chromatog. Although the initial steps of the in vivo mechanism responsible for phosphorylation of potato starch remains elusive, the present study demonstrates that the enzyme machinery available in potato has the ability to incorporate phosphorylated α(1→4)glucans into neutral polysaccharides in an interchain catalytic reaction. Potato mini tubers synthesized phosphorylated starch from exogenously supplied 33PO43- and [U-14C]Glc at rates 4 times higher than those previously obtained using tubers from fully grown potato plants. This system was more reproducible compared with soil-grown tubers and was therefore used for preparation of 33P-labeled phosphorylated α(1→4)glucan chains.

CC 7-3 (Enzymes)
Section cross-reference(s): 11

ST phosphorylated glucan potato starch branching **enzyme**; branched phosphorylated polysaccharide starch branching **enzyme**

IT **Polysaccharides, biological studies**
RL: BSU (Biological study, unclassified); MFM (Metabolic formation); BIOL (Biological study); FORM (Formation, nonpreparative)
(**branched**, phosphorylated; phosphorylated α(1→4)glucans as substrate for potato starch-**branching enzyme** I)

IT Potato (Solanum tuberosum)
(phosphorylated α(1→4)glucans as substrate for potato starch-branching **enzyme** I)

IT 9001-97-2, Starch-branching **enzyme**
RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); BIOL (Biological study)
(I; phosphorylated α(1→4)glucans as substrate for potato starch-branching **enzyme** I)

IT 9051-96-1DP, α(1→4)Glucan, phosphorylated
RL: BPN (Biosynthetic preparation); BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PREP (Preparation); PROC (Process)
(phosphorylated α(1→4)glucans as substrate for potato starch-branching **enzyme** I)

IT **9005-25-8D**, Starch, phosphorylated, biological studies
9037-22-3D, Amylopectin, phosphorylated
RL: BSU (Biological study, unclassified); MFM (Metabolic formation); BIOL (Biological study); FORM (Formation, nonpreparative)
(phosphorylated α(1→4)glucans as substrate for potato starch-branching **enzyme** I)

REFERENCE COUNT: 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L96 ANSWER 12 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1993:428484 CAPLUS
DOCUMENT NUMBER: 119:28484
TITLE: Attempt to control sequence of branched polysaccharide with enzymic hydrolysis and/or copolymerization
AUTHOR(S): Hatanaka, Kenichi; Song, Soo Chang; Maruyama, Atsushi; Kobayashi, Akira; Kuzuhara, Hiroyoshi; Akaike, Toshihiro
CORPORATE SOURCE: Dep. Biomol. Eng., Tokyo Inst. Technol., Yokohama, 227, Japan
SOURCE: Polymer Journal (Tokyo, Japan) (1993), 25(4), 373-8
CODEN: POLJB8; ISSN: 0032-3896
DOCUMENT TYPE: Journal

LANGUAGE: English
ED Entered STN: 24 Jul 1993
AB 2,4-Di-O-benzyl-(1 → 6)-α-D-glucopyranan, which was synthesized by ring-opening polymerization of 1,6-anhydro-3-O-benzoyl-2,4-di-O-benzyl-β-D-glucopyranose (I) and subsequent selective deprotection of the obtained polymer, was glucosylated to give branched polysaccharide having several different anomeric ratios of branching units. β-Glucosidase (cellulase) cleaved only β-**glucosidic** linkage of the synthesized polysaccharide to give a α-glucose-branched polysaccharide with controlled branching distribution. The sequence control of the OH group (branching point) in the polysaccharide was attempted also by copolymn. I copolymd. with tri-O-benzyl-levoglucosan with PF5 as catalyst in CH2Cl at -60°, giving highly stereoregular copolymers. The monomer reactivity ratios calculated by Kelen-Tuidois method were r1 = 0.27 and r2 = 2.5.
CC 33-5 (Carbohydrates)
Section cross-reference(s): 44
IT **Polysaccharides, preparation**
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation, glucosylation, and enzymic hydrolysis of **branched**, for **branching**-distribution control)

L96 ANSWER 13 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1993:77295 CAPLUS
DOCUMENT NUMBER: 118:77295
TITLE: Modulation of the composition of plant storage polysaccharides by expression of the gene for an heterologous branching **enzyme.**
INVENTOR(S): Willmitzer, Lothar; Sonnewald, Uwe; Kossmann, Jens; Mueller-Roeber, Bernd
PATENT ASSIGNEE(S): Institut fuer Genbiologische Forschung Berlin GmbH, Germany
SOURCE: Ger. Offen., 18 pp.
CODEN: GWXXBX
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 4104782	A1	19920820	DE 1991-4104782	19910213
DE 4104782	B4	20060511		
CA 2104123	AA	19920814	CA 1992-2104123	19920211
WO 9214827	A1	19920903	WO 1992-EP302	19920211
W: AU, CA, HU, JP, KR, RU, US				
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, MC, NL, SE				
AU 9212265	A1	19920915	AU 1992-12265	19920211
AU 663072	B2	19950928		
EP 571427	A1	19931201	EP 1992-904007	19920211
EP 571427	B1	20031008		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, MC, NL, SE				
HU 65740	A2	19940728	HU 1993-2336	19920211
EP 1103617	A2	20010530	EP 2001-100504	19920211
EP 1103617	A3	20011128		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC				
AT 251671	E	20031015	AT 1992-904007	19920211
ES 2204889	T3	20040501	ES 1992-904007	19920211
US 6215042	B1	20010410	US 1993-104158	19930813
US 6570066	B1	20030527	US 2000-609040	20000630

PRIORITY APPLN. INFO.:

DE 1991-4104782	A	19910213
EP 1992-904007	A3	19920211
WO 1992-EP302	A	19920211
US 1993-104158	A2	19930813
US 1996-726705	B1	19961007

ED Entered STN: 02 Mar 1993

AB A cDNA for a branching enzyme is placed under control of heterologous promoters in sense or antisense orientation to modulate branching enzyme activity and plant carbohydrate content. A cDNA encoding potato branching enzyme was obtained from a bank in λgt11 by antibody screening and placed under the control of the cauliflower mosaic virus 35S promoter or the patatin 33B gene in sense and antisense orientations. These constructs were introduced in potato cells by Agrobacterium-mediated transformation.

IC ICM A01H005-00
ICS C12N015-82; C08B030-20; C08B030-00

ICA C12N009-24; C12N015-74; C12N015-70; C12Q001-42; G01N033-68

CC 11-2 (Plant Biochemistry)
Section cross-reference(s): 3, 7

ST branching **enzyme** cDNA expression plant; carbohydrate content plant modulation debranching **enzyme**

IT Plasmid and Episome
(P33-BE, potato branching **enzyme** cDNA on, expression in transgenic plants of)

IT Plasmid and Episome
(P33-anti-BE, potato branching **enzyme** cDNA on, expression in transgenic plants of)

IT Plasmid and Episome
(P35S-BE, potato branching **enzyme** cDNA on, expression in transgenic plants of)

IT Plasmid and Episome
(P35S-anti-BE, potato branching **enzyme** cDNA on, expression in transgenic plants of)

IT Gene, plant
RL: BIOL (Biological study)
(cDNA, for potato branching **enzyme**, cloning in Escherichia coli and expression in crop plants of)

IT Barley
Corn
Pea
Plant
Potato
Rice
Soybean
Sugarcane
Tobacco
Tomato
Wheat
(carbohydrate content of, modulation of, expression of potato debranching **enzyme** cDNA in relation to)

IT Plant cell
(expression of potato debranching **enzyme** cDNA in, modulation of plant carbohydrate content in relation to)

IT Carbohydrates and Sugars, biological studies
Monosaccharides
Oligosaccharides
Polysaccharides, biological studies
RL: BIOL (Biological study)
(in plants, composition of, modulation of, sense or antisense expression of cDNA for **branching enzymes** in relation to)

IT Molecular cloning
(of cDNA for potato branching **enzyme**, in Escherichia coli)
IT Ribonucleic acids
RL: BIOL (Biological study)
(antisense, of branching **enzyme** cDNA, formation in plants of, modulation of carbohydrate metabolism in relation to)
IT **Enzymes**
RL: BIOL (Biological study)
(branching, cDNA for, sense or antisense expression in plants of, for modulation of carbohydrate content)
IT Plant
(crop, carbohydrate content of, modulation of, expression of potato debranching **enzyme** cDNA in relation to)
IT Oligosaccharides
RL: BIOL (Biological study)
(di-, in plants, composition of, modulation of, sense or antisense expression of cDNA for branching **enzymes** in relation to)
IT Glycoproteins, specific or class
RL: BIOL (Biological study)
(patatins, B33, gene for, promoter of, in expression branching **enzyme** cDNAs in transgenic plants)
IT Genetic element
RL: BIOL (Biological study)
(promoter, plant-derived, in expression of branching **enzyme** cDNAs in transgenic plants)
IT Genetic element
RL: BIOL (Biological study)
(promoter, 35S, in expression branching **enzyme** cDNAs in transgenic plants)
IT Beet
(sugar, carbohydrate content of, modulation of, expression of potato debranching **enzyme** cDNA in relation to)
IT Genetic element
RL: BIOL (Biological study)
(terminator, plant-derived, in expression of branching **enzyme** cDNAs in transgenic plants)
IT 9001-97-2, Branching **enzyme**
RL: BIOL (Biological study)
(fusion products with β-galactosidase, chimeric gene for, expression in Escherichia coli of)
IT **9005-25-8**, Starch, biological studies
RL: BIOL (Biological study)
(in plants, composition of, modulation of, sense or antisense expression of cDNA for branching **enzymes** in relation to)
IT 9005-82-7, Amylose
RL: BIOL (Biological study)
(in plants, ratio to amylopectin of, modulation of, sense or antisense expression of cDNA for branching **enzymes** in relation to)
IT 9037-22-3, Amylopectin
RL: BIOL (Biological study)
(in plants, ratio to amylose of, modulation of, sense or antisense expression of cDNA for branching **enzymes** in relation to)

L96 ANSWER 14 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1993:147922 CAPLUS
DOCUMENT NUMBER: 118:147922
TITLE: Novel reaction route including **enzymic** reaction for a synthesis of a branched polysaccharide
AUTHOR(S): Hatanaka, Kenichi; Song, Soo Chang; Maruyama, Atsushi; Akaike, Toshihiro; Kobayashi, Akira; Kuzuhara,

Hiroyoshi
CORPORATE SOURCE: Dep. Biomol. Eng., Tokyo Inst. Technol., Yokohama, 227, Japan
SOURCE: Journal of Carbohydrate Chemistry (1992), 11(8), 1027-37
CODEN: JCACDM; ISSN: 0732-8303
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 13 Apr 1993
AB Stereoselective synthesis of α-D-glucosyl-branching polysaccharide by chemical and enzymic reactions was investigated. Ring-opening polymerization of 1,6-anhydro-3-O-benzoyl-2,4-di-O-benzyl-β-D-glucopyranose with PF5 as catalyst at low **temperature** gave a highly stereoregular polymer, which was converted to 2,4-di-O-benzyl-(1→6)-α-D-glucopyranan by debenzoylation with sodium methoxide. The polymer was glucosylated according to the glycosyl imidate method to give a (1→6)-α-D-glucopyranan having α-D-glucopyranosyl and β-D-glucopyranosyl branches. Only the β-D-glucopyranosyl branch of the polymer was completely removed by enzymic hydrolysis by the use of cellulase to provide stereoregular (1→6)-α-D-glucopyranan having an α-D-glucopyranosyl branch at the C-3 position. Polymers were characterized by optical rotation, NMR spectroscopy, GPC, and x-ray diffractometry.
CC 33-5 (Carbohydrates)
Section cross-reference(s): 7, 9
IT **Polysaccharides, preparation**
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(**branched**, α-D-glycopyranosyl, preparation of, by homopolymn. of anhydroglucopyranose derivative)

L96 ANSWER 15 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN
ACCESSION NUMBER: 1992:104513 CAPLUS
DOCUMENT NUMBER: 116:104513
TITLE: Branched oligosaccharide syrups and their **enzymic** manufacture
INVENTOR(S): Ogata, Fumika; Kimura, Takashi
PATENT ASSIGNEE(S): Chiyoda Chemical Engineering and Construction Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 03175989	A2	19910731	JP 1989-312388	19891201

PRIORITY APPLN. INFO.: JP 1989-312388 19891201
ED Entered STN: 20 Mar 1992
AB Branched oligosaccharide syrups containing 5-20 weight% glucose and 50-90 weight% branched oligosaccharides containing 70-95 weight% tri- or higher branched oligosaccharides are manufactured by treating starch hydrolyzates having dextrose equivalent (DE) 20-40 and 20-70 weight% solid concentration with 0.002-0.04 IU/g (immobilized) α-glucosyltransferases. The syrups are useful as anticariogenic sweeteners. Corn starch slurry with 30 weight% solid concentration

was hydrolyzed with Kleistase (α-amylase) to give starch hydrolyzates with DE 25, which were then treated with 0.005 IU/g Amano (α-glucosidase) at 50° and pH 7.2 for 12 h to manufacture a syrup containing glucose 13.6, maltooligosaccharides 12.4, and 91.3 weight% tri- or higher oligosaccharide-containing isomaltooligosaccharides 62.0 weight%.

IC ICM C12P019-16
ICS A23L001-09

CC 16-5 (Fermentation and Bioindustrial Chemistry)
Section cross-reference(s): 17

IT **9005-25-8D**, Starch, hydrolyzates
RL: BIOL (Biological study)
(branched oligosaccharide syrups manufacture from, with glucosidase)

IT 50-99-7P, **Glucose**, preparation
RL: **PREP (Preparation)**
(syrups containing **branched** oligosaccharides and, manufacture of, with glucosidase)

L96 ANSWER 16 OF 37 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN
ACCESSION NUMBER: 2002-508793 [54] WPIX
DOC. NO. CPI: C2002-144719
TITLE: New truncated nucleic acid encoding fructosyl transferase, useful for preparing polyfructans, or derivatives, from sucrose, for use as food and feed additives.
DERWENT CLASS: B04 D13 D16 D17
INVENTOR(S): ENGELS, D; HAJI BEGLI, A; KUNZ, M; MATTES, R; MUNIR, M; VOGEL, M; BEGLI, A H; HAJI, B A
PATENT ASSIGNEE(S): (SUED-N) SUEDZUCKER AG; (SUED-N) SUEDZUCKER AG MANNHEIM/OCHSENFURT; (BEGL-I) BEGLI A H; (ENGE-I) ENGELS D; (KUNZ-I) KUNZ M; (MATT-I) MATTES R; (MUNI-I) MUNIR M; (VOGE-I) VOGEL M
COUNTRY COUNT: 28
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
WO 2002050257	A2	20020627	(200254)*	GE	90	C12N009-10<--
RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR						
W: AU CA IL JP MX RU US ZA						
DE 10106163	A1	20020725	(200256)			C12N009-10<--
AU 2002027939	A	20020701	(200264)			C12N009-10<--
EP 1346032	A2	20030924	(200363)	GE		C12N009-10<--
R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR						
US 2004086902	A1	20040506	(200430)			C12Q001-68
JP 2004524826	W	20040819	(200455)		128	C12N015-09
ZA 2003004825	A	20040825	(200466)		92	C12N000-00
MX 2003005645	A1	20040501	(200482)			C07K016-16

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 2002050257	A2	WO 2001-EP13524	20011121
DE 10106163	A1	DE 2001-10106163	20010210
AU 2002027939	A	AU 2002-27939	20011121
EP 1346032	A2	EP 2001-989498	20011121
		WO 2001-EP13524	20011121

US 2004086902	A1	WO 2001-EP13524	20011121
		US 2003-450896	20031208
JP 2004524826	W	WO 2001-EP13524	20011121
		JP 2002-552134	20011121
ZA 2003004825	A	ZA 2003-4825	20030620
MX 2003005645	A1	WO 2001-EP13524	20011121
		MX 2003-5645	20030620

FILING DETAILS:

PATENT NO	KIND		PATENT NO
AU 2002027939	A	Based on	WO 2002050257
EP 1346032	A2	Based on	WO 2002050257
JP 2004524826	W	Based on	WO 2002050257
MX 2003005645	A1	Based on	WO 2002050257

PRIORITY APPLN. INFO: DE 2001-10106163 20010210; DE 2000-10063889 20001221

INT. PATENT CLASSIF.:

MAIN: C07K016-16; C12N000-00; **C12N009-10**; C12N015-09; C12Q001-68

SECONDARY: A01H005-00; A23L001-29; A61K031-7016; A61K031-702; A61P003-04; C07H003-04; C07H003-06; C07H021-04; C07K016-40; C07K016-42; **C08B037-00**; **C08B037-18**; C12N005-10; C12N015-11; C12N015-54; C12N015-63; C12N015-82; C12P019-04; C12P019-12; C12P019-14; C12P019-18

BASIC ABSTRACT:

WO 200250257 A UPAB: 20021031

NOVELTY - Nucleic acid (I) comprising a 2388 base pair sequence (S1), or encoding a 795 residue amino acid sequence (S2) with fructosyl transferase (FT) activity, both given in the specification, and having at least one deletion in the 5'- or 3'-regions of nucleotides 4-222, 1-104 or 2254-2385, is new.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) vector containing (I);

(2) host cell containing (I) or the vector of (1);

(3) plant (A) that contains in at least one cell, (I) or the vector of (1), or at least one cell of (2);

(4) seeds, fruits, replicative or harvested materials, or plant tissues of (A);

(5) protein (II) with FT activity obtained by expressing (I);

(6) antibody specific for (II);

(7) antibody (AAb) specific for Ab;

(8) producing a genetically modified plant (A') able to produce a polyfructan (PF);

(9) producing PF by culturing cells of (2) or (A), or their tissues;

(10) PF produced by method (9);

(11) producing fructo-oligosaccharides (FOS);

(12) FOS produced by method (11);

(13) hydrogenated FOS produced by hydrogenating the FOS of (12);

(14) producing difructosedianhydrides (DFDA); and

(15) DFDA produced by method of (14).

ACTIVITY - Gastrointestinal-Gen.

No biological data is given.

MECHANISM OF ACTION - None given.

USE - (I) is used for recombinant production of FT and this is used to produce polyfructans (PF), specifically inulin, optionally for

conversion to inulin esters or ethers, optionally hydrogenated fructo-oligosaccharides (FOS), or difructosedianhydride (DFDA). FOS and DFDA are useful as probiotic additives in human or animal nutrition.

ADVANTAGE - (I) produce PF, especially inulin, with a very low degree of **branching** and very low **glucose** content. The deleted coding sequences provide much better growth of heterologous cells than the wild-type sequence, with higher volume yields. In a typical case, expression of the wild-type FT sequence in Escherichia coli produced 1.8 FT units/mg after 3 hours, compared to 5.2 FT units/mg for a sequence that lacked the 2254-2385 region.

Dwg.0/6

FILE SEGMENT: CPI
FIELD AVAILABILITY: AB; DCN
MANUAL CODES: CPI: B04-A08C2E; B04-C01G; B04-C02D; B04-C02X; B04-E03E; B04-E08; B04-F0800E; B04-G03; B04-L0400E; B04-N01A0E; B14-E10; D03-H01T2; D05-A02B; D05-C03D; D05-C08; D05-H11; D05-H12A; D05-H12E; D05-H14; D05-H14B3; D05-H16A; D05-H17A3; D06-G

TECH UPTX: 20020823

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Nucleic Acid: (S1) and (S2) are from Streptococcus mutans. (I) may be DNA or RNA.

Preferred Vector: The vector is a cosmid, phage, plasmid, liposome or virus, with (I) under control of usual regulatory elements, optionally including a signal sequence for localization in a specific organelle, compartment or extracellular space. Most preferably it contains at least one regulatory element from the L-rhamnose operon of Escherichia coli.

Preferred Hosts: Cells of (2) are prokaryotic or eukaryotic, particularly bacterial, yeast or plants (e.g. potato, artichoke, sugar beet etc.).

Preferred Protein: (II) converts sucrose to PF having predominantly beta-1,2-links.

Preparation: The FT-encoding gene of S. mutans DSM 20523 was isolated by standard polymerase chain reaction (PCR), primer sequences reproduced, and cloned into pJOE2702 to form pDHE113. This served as **template** for amplifying sequences having the specified deletions and the amplicons cloned into pJOE2702. The recombinant plasmids were used for cell/plant transformation conventionally.

Preferred Process: In method (9), transformed cells are cultured, lysed and (II), either as crude extract, purified enzyme or in immobilized form, is used to treat a sucrose solution, to produce PF, specifically an inulin with degree of polymerization over 100 and degree of branching not over 3 %. The inulin is optionally treated with an endo-inulinase (Iase) to form FOS or treated simultaneously with Iase and optionally immobilized cells of Arthrobacter globiformes or A. ureafaciens to produced DFDA. Optionally, DFDA is produced by simultaneous treatment of a sucrose solution with (II), Iase and the Arthrobacter cells.

L96 ANSWER 17 OF 37 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN
ACCESSION NUMBER: 2002-134411 [18] WPIX
DOC. NO. CPI: C2002-041767
TITLE: High degree branched starch as nutrition supplement food, has specific branch chain length distribution and molecular weight distribution.
DERWENT CLASS: B04 D13 D16
PATENT ASSIGNEE(S): (AKIT-N) AKITA KEN
COUNTRY COUNT: 1
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
JP 2001294601	A	20011023	(200218)*		11	C08B030-00<--

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
JP 2001294601	A	JP 2000-108867	20000411

PRIORITY APPLN. INFO: JP 2000-108867 20000411
INT. PATENT CLASSIF.:
MAIN: **C08B030-00**
SECONDARY: A23L001-0522; A23L001-10; **C12N009-10**; C12P019-18

BASIC ABSTRACT:

JP2001294601 A UPAB: 20020319

NOVELTY - The **branch** chain length (**glucose** chain length), determined by anion exchange chromatography, of high degree branched (HDB) starch shows peak at 4-7. HDB starch is highly **soluble** in water and its aqueous solution has low viscosity. The molecular weight distribution of starch determined by gel filtration analysis shows peak at 2.0 multiply 10 to power 6.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following

(1) Manufacture of HDB starch which involves reacting branching enzyme on gelatinized starch. The raw material starch has low branching degree compared to the product;

(2) Aging inhibition method which involves adding 0.1-100 weight% of HDB starch to gelatinized;

(3) Manufacture of food and drink containing starch which involves adding 0.1-100 weight% of HDB starch to starch; and

(4) Food and drink containing HDB starch.

USE - As isotonic drink, nutrition supply food. Also as adhesive and as raw material for biodegradable polymers, paper and capsule.

ADVANTAGE - The aging of gelatinized starch is prevented. The solubility of starch in water is improved without lowering molecular weight. The handling of viscous starch solution is made easier. The reduction of adhesive property, preserving property, frozen resistance and digestibility of starch are inhibited.

DESCRIPTION OF DRAWING(S) - The graph shows variation of transparency of starch solution by the advancement of enzyme reaction. (Drawing includes non-English language text).

Dwg.1/12

FILE SEGMENT: CPI
FIELD AVAILABILITY: AB; GI; DCN
MANUAL CODES: CPI: B04-C02B; B12-M03; B14-E11; D03-H01G; D03-H01T
TECH UPTX: 20020319

TECHNOLOGY FOCUS - BIOLOGY - Preferred Enzyme: The branching enzyme is derived from mutant of fungi belonging to Neurospora crassa of N2-44 strain. 1-1000 unit of branching enzyme is added to 1 g of gelatinized starch.

L96 ANSWER 18 OF 37 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN
ACCESSION NUMBER: 2000-225175 [20] WPIX
DOC. NO. NON-CPI: N2000-168722
DOC. NO. CPI: C2000-068924
TITLE: New nucleic acid encoding potato beta-amylase, used to produce transgenic plants that contain modified starch.
DERWENT CLASS: A60 B04 C06 D13 D16 F09 G03 P13 Q34
INVENTOR(S): FROHBERGER, C; FROHBERG, C
PATENT ASSIGNEE(S): (FARB) BAYER CROPSCIENCE GMBH; (AVET) AVENTIS CROPSCIENCE

GMBH; (AGRE) HOECHST-SCHERING AGREVO GMBH
COUNTRY COUNT: 87
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
DE 19836099	A1	20000203	(200020)*		21	C12N015-56
WO 2000008185	A1	20000217	(200020)	GE		C12N015-82
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ UG ZW						
W: AE AL AM AU AZ BA BB BG BR BY CA CN CU CZ EE GD GE HR HU ID IL IN IS JP KG KP KR KZ LC LK LR LT LV MD MG MK MN MX NO NZ PL RO RU SG SI SK TJ TM TR TT UA US UZ VN YU ZA						
AU 9954167	A	20000228	(200030)			C12N015-82
EP 1100939	A1	20010523	(200130)	GE		C12N015-82
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI						
CN 1316005	A	20011003	(200205)			C12N015-82
JP 2002523023	W	20020730	(200264)		65	C12N015-09
AU 769130	B	20040115	(200409)			C12N015-82
US 6791010	B1	20040914	(200460)			C12N015-29

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
DE 19836099	A1	DE 1998-1036099	19980731
WO 2000008185	A1	WO 1999-EP5523	19990730
AU 9954167	A	AU 1999-54167	19990730
EP 1100939	A1	EP 1999-939781	19990730
		WO 1999-EP5523	19990730
CN 1316005	A	CN 1999-810307	19990730
JP 2002523023	W	WO 1999-EP5523	19990730
		JP 2000-563808	19990730
AU 769130	B	AU 1999-54167	19990730
US 6791010	B1	WO 1999-EP5523	19990730
		US 2001-744852	20010531

FILING DETAILS:

PATENT NO	KIND		PATENT NO
AU 9954167	A	Based on	WO 2000008185
EP 1100939	A1	Based on	WO 2000008185
JP 2002523023	W	Based on	WO 2000008185
AU 769130	B	Previous Publ.	AU 9954167
		Based on	WO 2000008185
US 6791010	B1	Based on	WO 2000008185

PRIORITY APPLN. INFO: DE 1998-19836099 19980731
INT. PATENT CLASSIF.:
MAIN: C12N015-09; C12N015-29; C12N015-56; C12N015-82
SECONDARY: A01H005-00; A23L001-0522; B65D065-46; C07H021-00; **C08B030-00**; C08L003-00; C09J103-00; C12N005-10; **C12N009-26**; C12N015-54; C12N015-63; C12P019-04; D21H017-28
BASIC ABSTRACT:
DE 19836099 A UPAB: 20021105
NOVELTY - Nucleic acid molecule (I) encodes a potato beta -amylase (bA) and:

(i) encodes a protein (2) of about 580 amino acids (reproduced);
(ii) is an approximately 1.9 kb sequence (1), reproduced;
(iii) hybridizes with (preferably specifically) or is complementary to, (i) or (ii); or
(iv) is equivalent to (i)-(iii) within the degeneracy of the genetic code.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(a) recombinant nucleic acid (I') containing:
(i) (I); and
(ii) at least one sequence (I'') encoding one or more of the proteins (A): **branching** enzyme; ADP-**glucose** pyrophosphorylase; starch-granule bound starch synthase; **soluble** starch synthase; debranching enzyme; disproportioning enzyme; plastid starch phosphorylase; R1 enzyme; amylase or glucosidase, or fragments of (A), or sequences that hybridize with (I'');
(b) nucleic acid (II) that hybridizes specifically with (I) or (I');
(c) vector containing (I), (I') or (II);
(d) host cell transformed with (I), (I'), (II) or the vector of (c), or its descendants;
(e) transgenic plant cells which synthesize modified starch produced by integration of (I), (I'), (II) or the vector of (c) into the genome;
(f) plants regenerated from cells of (e) and their reproductive materials; and
(g) starch produced by cells/plants of (e) or (f).

ACTIVITY - None given.

MECHANISM OF ACTION - None given.

USE - (I) is used to produce transgenic plants (or plant or bacterial cells) that produce starch with modified degrees of branching, amylose/amylopectin ratio, phosphate content, starch granule size and/or sidechain structure, and thus altered physical and chemical properties. This starch is used for all usual applications, particularly in preparation of foods, packaging materials and disposable articles, but also for hydrolysis to glucose (for manufacture of other chemicals or for fermentation), in paper/pulp manufacture; in adhesives; for treating textiles; for soil stabilization; as wetting agent in plant protection and fertilizer compositions; as binding agent in pharmaceuticals and cosmetics; as additive for rubber, building materials, leather and in casting; as flocculant for soil or coal slurries; and in polymers, as simple filler or reactive component, e.g. in polyurethane foams.

ADVANTAGE - Modified starch produced using plants that contain (I) are easily hydrolyzed, reducing the requirement for expensive enzymes.

Dwg.0/1

FILE SEGMENT: CPI GMPI
FIELD AVAILABILITY: AB; DCN
MANUAL CODES: CPI: A03-A; A10-A; B04-C02B; B04-E02E; B04-E03E; B04-F0100E; B04-F0800E; C04-C02B; C04-E02E; C04-E03E; C04-F0100E; C04-F0800E; D03-H01; D05-C08; D05-H12A; D05-H12D1; D05-H12D2; D05-H12E; D05-H14B3; D05-H16B; D05-H17A3; D05-H17B3; F05-A06C; G03-B02A

TECH UPTX: 20000426

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred Nucleic Acid: (I) and (I') is DNA, particularly cDNA, or RNA. Preferred vector: (I) and (I'') are present in sense and/or antisense orientations, and are coupled to usual regulatory elements functional in prokaryotic or eukaryotic cells. The vectors are assembled by essentially known methods and introduced into plant cells conventionally, e.g. via Agrobacterium of by protoplast fusion.

Preferred Plants: These are wheat, maize, potato or rice.

Preparation: A tuber-specific cDNA library from potato was expressed in

Escherichia coli and the cells exposed to iodine vapor. Plasmid DNA was isolated from clones that stained only weakly and sequenced to identify (1). The selected plasmid has been deposited as DSM 12347 and contains a 1.3 kb Asp718-BamHI fragment of (1), cloned between the cauliflower mosaic virus 35S promoter and the ocs terminator.

L96 ANSWER 19 OF 37 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN

ACCESSION NUMBER: 2000-225174 [20] WPIX
DOC. NO. NON-CPI: N2000-168721
DOC. NO. CPI: C2000-068923
TITLE: New nucleic acid encoding potato alpha-glucosidase, used to produce transgenic plants that contain modified starch.
DERWENT CLASS: A60 B04 C06 D13 D16 F09 G03 P13
INVENTOR(S): FROHBERG, C
PATENT ASSIGNEE(S): (FARB) BAYER CROPSCIENCE GMBH; (AVET) AVENTIS CROPSCIENCE GMBH; (AGRE) HOECHST-SCHERING AGREVO GMBH
COUNTRY COUNT: 87
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
DE 19836097	A1	20000203	(200020)*		21	C12N015-82
WO 2000008175	A2	20000217	(200020)	GE		C12N015-55
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ UG ZW						
W: AE AL AM AU AZ BA BB BG BR BY CA CN CU CZ EE GD GE HR HU ID IL IN IS JP KG KP KR KZ LC LK LR LT LV MD MG MK MN MX NO NZ PL RO RU SG SI SK TJ TM TR TT UA US UZ VN YU ZA						
AU 9957297	A	20000228	(200030)			C12N015-55
EP 1100931	A2	20010523	(200130)	GE		C12N015-55
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI						
CN 1316003	A	20011003	(200205)			C12N015-55
JP 2002524045	W	20020806	(200266)		71	C12N015-09
AU 770735	B2	20040304	(200453)			C12N015-55
US 6794558	B1	20040921	(200462)			A01H005-00

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
DE 19836097	A1	DE 1998-1036097	19980731
WO 2000008175	A2	WO 1999-EP5536	19990730
AU 9957297	A	AU 1999-57297	19990730
EP 1100931	A2	EP 1999-944315	19990730
		WO 1999-EP5536	19990730
CN 1316003	A	CN 1999-810309	19990730
JP 2002524045	W	WO 1999-EP5536	19990730
		JP 2000-563799	19990730
AU 770735	B2	AU 1999-57297	19990730
US 6794558	B1	WO 1999-EP5536	19990730
		US 2001-744926	20010130

FILING DETAILS:

PATENT NO	KIND	PATENT NO
AU 9957297	A Based on	WO 2000008175
EP 1100931	A2 Based on	WO 2000008175

JP 2002524045	W	Based on	WO 2000008175
AU 770735	B2	Previous Publ.	AU 9957297
		Based on	WO 2000008175
US 6794558	B1	Based on	WO 2000008175

PRIORITY APPLN. INFO: DE 1998-19836097 19980731
INT. PATENT CLASSIF.:
MAIN: A01H005-00; C12N015-09; C12N015-55; C12N015-82
SECONDARY: A01H005-10; A23L001-0522; C07H021-00; **C08B030-00**; C12N001-15; C12N001-19; C12N001-21; C12N005-10; **C12N009-26**; C12N015-11; C12N015-54; C12N015-56; C12N015-63; C12N015-79; C12P019-04

BASIC ABSTRACT:

DE 19836097 A UPAB: 20000426

NOVELTY - Nucleic acid molecule (I) encodes a potato alpha -glucosidase (aG) and:

(i) encodes a protein (2) of about 680 amino acids (reproduced);

(ii) is an approximately 2.3 kb sequence (1), reproduced;

(iii) hybridizes with (preferably specifically) or is complementary to, (i) or (ii); or

(iv) is equivalent to (i)-(iii) within the degeneracy of the genetic code.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(a) recombinant nucleic acid (I') containing:

(i) (i) (I); and

(ii) at least one sequence (I'') encoding one or more of the proteins (A): **branching** enzyme; ADP-**glucose** pyrophosphorylase; starch-granule bound starch synthase; **soluble** starch synthase; debranching enzyme; disproportioning enzyme; plastid starch phosphorylase; R1 enzyme; amylase or glucosidase, or fragments of (A), or sequences that hybridize with (I'');

(b) nucleic acid (II) that hybridizes specifically with (I) or (I');

(c) vector containing (I), (I') or (II);

(d) host cell transformed with (I), (I'), (II) or the vector of (c), or its descendants;

(e) transgenic plant cells which synthesize modified starch produced by integration of (I), (I'), (II) or the vector of (c) into the genome;

(f) plants regenerated from cells of (e) and their reproductive materials; and

(g) starch produced by cells/plants of (e) or (f).

ACTIVITY - None given.

MECHANISM OF ACTION - None given.

USE - (I) is used to produce transgenic plants (or plant or bacterial cells) that produce starch with modified degrees of branching, amylose/amylopectin ratio, phosphate content, starch granule size and/or sidechain structure, and thus altered physical and chemical properties. This starch is used for all usual applications, particularly in preparation of foods, packaging materials and disposable articles, but also for hydrolysis to glucose (for manufacture of other chemicals or for fermentation), in paper/pulp manufacture; in adhesives; for treating textiles; for soil stabilization; as wetting agent in plant protection and fertilizer compositions; as binding agent in pharmaceuticals and cosmetics; as additive for rubber, building materials, leather and in casting; as flocculant for soil or coal slurries; and in polymers, as simple filler or reactive component, e.g. in polyurethane foams.

ADVANTAGE - Modified starch produced using plants that contain (I) are easily hydrolyzed, reducing the requirement for expensive enzymes.

Dwg.0/1

FILE SEGMENT: CPI GMPI

FIELD AVAILABILITY: AB; DCN
MANUAL CODES: CPI: A03-A; A10-A; B04-C02B; B04-E02E; B04-E03E; B04-F0100E; B04-F0800E; C04-C02B; C04-E02E; C04-E03E; C04-F0100E; C04-F0800E; D03-H01; D05-C08; D05-H12A; D05-H12B2; D05-H12D2; D05-H12E; D05-H14B3; D05-H16B; D05-H17A3; D05-H17B3; F05-A06C; G03-B02A

TECH UPTX: 20000426

TECHNOLOGY FOCUS - BIOTECHNOLOGY - Preferred nucleic acid: (I) and (I') is DNA, particularly cDNA, or RNA.
Preferred vector: (I) and (I'') are present in sense and/or antisense orientations, and are coupled to usual regulatory elements functional in prokaryotic or eukaryotic cells. The vectors are assembled by essentially known methods and introduced into plant cells conventionally, e.g. via Agrobacterium of by protoplast fusion.
Preferred plants: These are wheat, maize, potato or rice.
Preparation: Total RNA was isolated from potato tubers, polyadenylated sequences selected and used to construct a cDNA library. This was screened with a radioactive probe, GeneBank sequence T76451, to isolate (1). A plasmid containing this sequence has been deposited as DSM 12348.

L96 ANSWER 20 OF 37 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN
ACCESSION NUMBER: 1994-238672 [29] WPIX
DOC. NO. CPI: C1994-108984
TITLE: Potentiator of immuno activity of vaccine for virus and bacteria - comprises glucan having beta-1,3-glucoside main chain.
DERWENT CLASS: B04
PATENT ASSIGNEE(S): (TAIT) TAITO KK
COUNTRY COUNT: 1
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
JP 06172217	A	19940621	(199429)*		6	A61K039-39
JP 3522772	B2	20040426	(200428)		6	A61K039-39

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
JP 06172217	A	JP 1991-116158	19910521
JP 3522772	B2	JP 1991-116158	19910521

FILING DETAILS:

PATENT NO	KIND	PATENT NO
JP 3522772	B2 Previous Publ.	JP 06172217

PRIORITY APPLN. INFO: JP 1991-116158 19910521
INT. PATENT CLASSIF.:
MAIN: A61K039-39
SECONDARY: A61K031-715; A61K039-02; A61K039-12; A61P031-04; A61P031-12
ADDITIONAL: **C08B037-00**
BASIC ABSTRACT:
JP 06172217 A UPAB: 19940907
Potentiator comprises glucan having a main chain comprising beta-1,3-glycoside (**polysaccharide**).
Glucan is pref. schizophyllan, lentinan, scleroglucan, glucan or

curdlan. The orally dose is pref. 1-1000(10-200) mg/kg. The injection dose is pref. 0.1-1000 (1-50)mg/kg. **Branched** or straight beta-1,3-glucan is found in fungi, esp.in mushrooms.

USE/ADVANTAGE - The **polysaccharide** is not decomposed by an **enzyme** in a body, and has low toxicity without causing side effects when administered through injection. It is non-toxic when administered orally. The **polysaccharide** is derivative from a natural prod. but its potentiating activity is obtd. when administered as food or fodder, and it is not necessary to highly purify it. The combined amin. of vaccine and **polysaccharide** intensifies IgA concentration in blood and IgA antibody prod. and increases activity of macrophage. The infection inhibiting activity is obtd. when the amount of vaccine is decreased.

Dwg.0/0

FILE SEGMENT: CPI
FIELD AVAILABILITY: AB; GI
MANUAL CODES: CPI: B04-C02D; B14-S09; B14-S11

L96 ANSWER 21 OF 37 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN
ACCESSION NUMBER: 1988-081819 [12] WPIX
DOC. NO. CPI: C1988-036805
TITLE: Crosslinked poly glucan - obtd. by adding amylase to poly glucan and crosslinking until solubility reaches specific value.
DERWENT CLASS: A11 D16
PATENT ASSIGNEE(S): (HITA) HITACHI LTD
COUNTRY COUNT: 1
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
JP 63035605	A	19880216	(198812)*		9	
JP 05076961	B	19931025	(199345)		9	C08B035-00

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
JP 63035605	A	JP 1986-177512	19860730
JP 05076961	B	JP 1986-177512	19860730

FILING DETAILS:

PATENT NO	KIND		PATENT NO
JP 05076961	B	Based on	JP 63035605

PRIORITY APPLN. INFO: JP 1986-177512 19860730
INT. PATENT CLASSIF.: **C08B037-00**; C12N011-10
MAIN: C08B035-00
SECONDARY: **C08B037-18**; C12N011-10
ADDITIONAL: **C12N009-34**

BASIC ABSTRACT:

JP 63035605 A UPAB: 19930923

Crosslinked polyglucane comprises crosslinking polyglucan, between the molecule or within the molecule. The polyglucane is bonded branched chain to the main chain which is polymerised glucose by alpha-1,4-bond. The **branched** chain is polymerised **glucose** by alpha-1,4 bond, and branched off from the main chain by alpha-1,6 bond, and its open end is unreducing glucose residue.

In production the polyglucane is added to amylase (beta-amylase and/or

glucoamylase). Then the polyglucane is subjected to crosslinking treatment until the solubility against water becomes below 0.01 at 60 deg.C.

Pref. **glucose** residue corresp. to **branching** point in the branched chain is at least 5% of total glucose residue number in a molecule. **Glucose** polymerisation number of the **branched** chain is pref. 2-6. The glucane is pref. glycogen or high branched type amylopectin.

USE/ADVANTAGE - The crosslinked polyglucane can absorb and purify glucoamylase with high selectivity, from the solution which contains various organic or inorganic impurity and the other enzymes.

0/2

FILE SEGMENT: CPI
FIELD AVAILABILITY: AB
MANUAL CODES: CPI: A03-A; A11-C02; A12-W11L; D05-A01A1; D05-A01B3

ABEQ JP 93076961 B UPAB: 19931220

Crosslinked polyglucan comprises crosslinking polyglucan, between the molecule or within the molecule. The polyglucan is bonded branched chain to the main chain which is polymerised glucose by alpha-1,4-bond. The **branched** chain is polymerised **glucose** by alpha-1,4 bond, and branched of from the main chain by alpha-1,6 bond, and its open end is non-reducing glucose residue.

In prodn. the polyglucan is added to amylase (beta-amylase and/or glucoamylase). Then the polyglucan is subjected to crosslinking treatment until the solubility against water becomes below 0.01 at 60 deg. C.

Pref. **glucose** residue corresp. to **branching** point in the branched chain is at least 5% of total glucose residue number in a molecule. **Glucose** polymerisation number of the **branched** chain is pref. 2-6. The glucan is pref. glycogen or high branched type amylopectin.

USE/ADVANTAGE - The crosslinked polyglucan can absorb and purify glucoamylase with high selectivity, from the soln. which contains various organic or inorganic impurity and the other enzymes. (J63035605-A)

L96 ANSWER 22 OF 37 WPIX COPYRIGHT 2006 THE THOMSON CORP on STN
ACCESSION NUMBER: 1987-047652 [07] WPIX
DOC. NO. CPI: C1987-020129
TITLE: **Branched** cyclodextrin production - using **glucose** or malto oligosaccharide(s) and cyclodextrin, in presence of pullulanase produced by Aerobacter.
DERWENT CLASS: A11 D16 D17
PATENT ASSIGNEE(S): (TOKU) TOKUYAMA SODA KK
COUNTRY COUNT: 1
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG	MAIN IPC
JP 62006696	A	19870113	(198707)*		6	
JP 04030277	B	19920521	(199225)		6	C12P019-16

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
JP 62006696	A	JP 1985-143953	19850702
JP 04030277	B	JP 1985-143953	19850702

FILING DETAILS:

PATENT NO	KIND	PATENT NO
JP 04030277	B Based on	JP 62006696

PRIORITY APPLN. INFO: JP 1985-143953 19850702
INT. PATENT CLASSIF.:
MAIN: C12P019-16
~~SECONDARY: C08B037-16; C12P019-04; C12R001-00~~
ADDITIONAL: **C12N009-44**
INDEX: **C12N009-44**, C12R001:01
BASIC ABSTRACT:
JP 62006696 A UPAB: 19930922
Branched cyclodextrins are produced by pullulanase reaction, where glucose or maltooligosaccharides having an F atom at the reducing end and cyclodextrin are reacted in the presence of pullulanase. The enzyme is produced by Aerobacter aerogenes as an exoenzyme. Optimum pH is 6.0-6.5, Stable pH range is 5.0-11.5, Optimum **temperature** is 50 deg.C with stable **temperature** range up to 50 deg.C The enzyme is not inhibited by Mn (2+) and Ag(+) and the inhibition by an SH-reagent is low. The enzyme is activated by Ca (2+). The mol.weight is about 70,000. The enzyme does not contain a cystein residue.

The branched chain is composed of one or more glucose or oligosaccharides. Ordinary usable cyclodextrin is alpha-, beta-, or gammacyclodextrin.

USE/ADVANTAGE - The yield and the rate of the reaction can be increased by the pullulanase reaction and use of fluoro-saccharides.

FILE SEGMENT: CPI
FIELD AVAILABILITY: AB
MANUAL CODES: CPI: A03-A; A10-A; D05-A02C; D05-C08; D06-H02

L96 ANSWER 23 OF 37 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2006) on STN DUPLICATE 1

ACCESSION NUMBER: 1998:48144 AGRICOLA
DOCUMENT NUMBER: IND21241205
TITLE: Characterization of SU1 isoamylase, a determinant of storage **starch** structure in maize.
AUTHOR(S): Rahman, A.; Wong, K.; Jane, J.I.; Myers, A.M.; James, M.G.
AVAILABILITY: DNAL (450 P692)
SOURCE: Plant physiology, June 1998. Vol. 117, No. 2. p. 425-435
CODEN: PLPHAY; ISSN: 0032-0889
NOTE: Includes references
PUB. COUNTRY: Maryland; United States
DOCUMENT TYPE: Article; Conference
FILE SEGMENT: Other US
LANGUAGE: English
ABSTRACT:
Function of the maize (Zea mays) gene sugary1 (su1) is required for normal ***starch*** biosynthesis in endosperm. Homozygous su1-mutant endosperms accumulate a highly branched polysaccharide, phytoglycogen, at the expense of the normal branched component of **starch**, amylopectin. These data suggest that both **branched polysaccharides** share a common precursor, and that the **product** of the su1 gene, designated SU1, participates in kernel **starch** biosynthesis. SU1 is similar in

sequence to alpha-(1 leads to >6) glucan hydrolases (**starch** -debranching **enzymes** [DBEs]). Specific antibodies were produced and used to demonstrate that SU1 is a 79-kD protein that accumulates in endosperm coincident with the time of **starch** biosynthesis. Nearly full-length SU1 was expressed in Escherichia coli and purified to apparent homogeneity. Two biochemical assays confirmed that SU1 hydrolyzes alpha-(1 leads to > 6) linkages in branched polysaccharides. Determination of the specific activity of SU1 toward various substrates enabled its classification as an isoamylase. Previous studies had shown, however, that su1-mutant endosperms are deficient in a different type of DBE, a pullulanase (or R **enzyme**). Immunoblot analyses revealed that both SU1 and a protein detected by antibodies specific for the rice (Oryza sativa) R **enzyme** are missing from su1-mutant kernels. These data support the hypothesis that DBEs are directly involved in ***starch*** biosynthesis.

CLASSIFICATION: F600 Plant Physiology and Biochemistry; F200 Plant Breeding and Genetics
CONTROLLED TERM (LC): Oryza sativa; Zea mays; amylopectin; biosynthesis; chemical constituents of plants; chemical structure; endosperm; **enzyme** activity; genes; genetic code; genetic variation; glycogen; isoamylase; measurement; mutants; pullulanase; **starch**
SUPPLEMENTARY TERM: genetic regulation; phytoglycogen; precursors; wild strains
CAS REGISTRY NO.: 9005-25-8 (STARCH)
9005-79-2 (GLYCOGEN)
9005-79-2 (PHYTOGLYCOGEN)
9012-72-0 (GLUCAN)
9037-22-3 (AMYLOPECTIN)
9067-73-6 (ISOAMYLASE)
9075-68-7 (PULLULANASE)
9075-68-7 (R-ENZYME)
89957-37-9 (ANTIBODIES)

L96 ANSWER 24 OF 37 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2006) on STN DUPLICATE 3

ACCESSION NUMBER: 93:21977 AGRICOLA
DOCUMENT NUMBER: IND93009603
TITLE: Purification and properties of a thermostable pullulanase from Clostridium thermosulfurogenes EM1 which hydrolyses both alpha-1,6 and alpha-1,4-glycosidic linkages.
AUTHOR(S): Spreinat, A.; Antranikian, G.
CORPORATE SOURCE: Georg-August-Universitat Gottingen, Gottingen, FRG
AVAILABILITY: DNAL (QR1.E9)
SOURCE: Applied microbiology and biotechnology, Aug 1990. Vol. 33, No. 5. p. 511-518
Publisher: Berlin, W. Ger. : Springer International.
CODEN: AMBIDG; ISSN: 0175-7598
NOTE: Includes references.
DOCUMENT TYPE: Article
FILE SEGMENT: Non-U.S. Imprint other than FAO
LANGUAGE: English
ABSTRACT:
A novel thermostable pullulanase, secreted by the thermophilic anaerobic bacterium Clostridium thermosulfurogenes EM1, was purified and characterized. Applying anion exchange chromatography and gel filtration the **enzyme** was purified 47-fold and had a specific activity of 200 units/mg. The molecular

mass of this thermostable **enzyme** was determined to be 102000 daltons and consisted of a single subunit. The **enzyme** was able to attack specifically the alpha-1,6-glycosidic linkages in pullulan and caused its complete hydrolysis to maltotriose. Surprisingly and unlike the **enzyme** from Klebsiella pneumoniae, the purified **enzyme** from this anaerobic thermophile exhibited, in addition to its debranching and pullulanase activity, an alpha-1,4 hydrolysing activity as well. By the action of this single polypeptide chain various **branched** and linear **polysaccharides** were completely converted to two major **products**, namely maltose and maltotriose. The Km values of this **enzyme** for pullulan and amylose were determined to be 1.33 mg/ml and 0.38 mg/ml, respectively. This debranching ***enzyme*** displays a **temperature** optimum at 60-65 degrees C and a pH optimum at 5.5-6.0. The application of this new class of pullulanase (pullulanase type II) in industry will significantly enhance the **starch** saccharification process.

CLASSIFICATION: X300 Life Sciences
CONTROLLED TERM (CABA): clostridium; **enzyme** activity; heat stability; hydrolysis; polysaccharides; pullulanase; purification; thermophilic bacteria
SUPPLEMENTARY TERM: pullulan
CAS REGISTRY NO.: 9005-25-8 (STARCH)
9005-82-7 (AMYLOSE)
9057-02-7 (PULLULAN)
9075-68-7 (PULLULANASE)
69-79-4Q, 37417-41-7Q (MALTOSE)
1109-28-0Q, 58295-65-1Q (MALTOTRIOSE)

L96 ANSWER 25 OF 37 FROSTI COPYRIGHT 2006 LFRA on STN
ACCESSION NUMBER: 505836 FROSTI
TITLE: High dextrose or high speed.
AUTHOR: Anon.
SOURCE: World of Ingredients, 1999, (July-August), 45 (0 ref.)
ISSN: 1380-491X
DOCUMENT TYPE: Journal
LANGUAGE: English
ABSTRACT: New Dextrozyme E, which is produced by Novo Nordisk, accelerates the conversion of liquefied **starch** to dextrose. Dextrozyme E consists of a new glucoamylase (for hydrolysing linear glucose chains) and a new pullulanase (for hydrolysing **branched glucose** chains). **Starch processors** can use the **enzyme** blend to produce high-fructose syrups (97 DX syrups) or for faster production of 95-96 DX syrups.
SUBJECT HEADING: CONFECTIONERY
CONTROLLED TERM: CARBOHYDRATES; DEGRADATION; DEXTROSE; **ENZYMES**; GLUCOSE; NEW PRODUCTS; POLYSACCHARIDES; **STARCH**
DATA ENTRY DATE: 21 Oct 1999

L96 ANSWER 26 OF 37 FROSTI COPYRIGHT 2006 LFRA on STN
ACCESSION NUMBER: 400318 FROSTI
TITLE: **Enzymes** in the **starch** and sugar industries.
AUTHOR: Woods L.F.J.; Swinton S.J.
SOURCE: Enzymes in food processing. (2nd edition), Published by: Blackie, Glasgow, 1995, 250-267 (44 ref.)
Tucker G.A.; Woods L.F.J.

Searched by Barb O'Bryen, STIC 2-2518

ISBN: 0-7514-0249-4
DOCUMENT TYPE: Book Article
LANGUAGE: English
ABSTRACT: **Starch**, a polysaccharide widely used in the food industry, is generally converted (by hydrolysis) to smaller saccharides by **enzymes**. In addition, **enzymes** may be useful in producing food components with slightly different functional properties that will improve/help develop new food products. Consideration is given to the application of hydrolytic **enzymes** (including liquefaction and saccharification, and the production of low-dextrose-equivalent maltodextrins), the utilisation of non-hydrolytic **enzymes** (**glucose** isomerase, **glucose** oxidase and a **branching** transferase) and the **production** of cyclodextrins and sugar esters by **enzymic** conversion of **starch** and sugars.
SUBJECT HEADING: SWEETENERS
CONTROLLED TERM: APPLICATIONS; CYCLODEXTRINS; **ENZYMES**; ESTERS; GLUCOSE; GLUCOSE ISOMERASE; HYDROLYSIS; LIQUEFACTION; MALTODEXTRINS; OXIDASES; PRODUCTION; **STARCH**; SUGAR; SUGAR ESTERS; TRANSFERASES
DATA ENTRY DATE: 30 Jan 1996

L96 ANSWER 27 OF 37 FROSTI COPYRIGHT 2006 LFRA on STN
ACCESSION NUMBER: 411592 FROSTI
TITLE: Debranching **enzymes** and DNA sequences coding them, suitable for changing the degree of branching of amylopectin **starch** in plants.
INVENTOR: Kossmann J.; Emmermann M.; Virgin I.
PATENT ASSIGNEE: Institut fur Genbiologische Forschung Berlin GmbH
SOURCE: European Patent Application
PATENT INFORMATION: EP 713531 A1
WO 9504826 19950216
DESIGNATED STATES: AT; BE; CH; DE; DK; ES; FR; GB; GR; IE; IT; LI; LU; MC; NL; PT; SE
APPLICATION INFORMATION: 19940808
PRIORITY INFORMATION: Germany, Federal Republic of 19930809
DOCUMENT TYPE: Patent
LANGUAGE: English
SUMMARY LANGUAGE: English
ABSTRACT: Amylopectin **starch** is a complex mixture of **branched glucose** chains. In the **preparation** of modified starches, it is desirable to regulate the proportion of amylopectin and unbranched (amylose) **starch.** DNA sequences are described for plant debranching **enzymes** derived from potato (Solanum tuberosum) capable of acting on amylopectin. A process for production of genetically modified plants, and plasmids carrying these DNA sequences, is disclosed.
SUBJECT HEADING: PROCESSING
CONTROLLED TERM: AMYLOPECTIN; AMYLOSE; BRANCHED; DNA; **ENZYMES** ; EUROPEAN PATENT; MODIFICATION; MODIFIED **STARCH**; **STARCH**; STRUCTURE
DATA ENTRY DATE: 28 Jun 1996

L96 ANSWER 28 OF 37 FROSTI COPYRIGHT 2006 LFRA on STN
ACCESSION NUMBER: 655630 FROSTI
TITLE: Lower alcohol insoluble extract of the young **branch** of Hovenia dulcis thunb., **polysaccharides** isolated therefrom and an antihepatotoxic composition containing same.
INVENTOR: Na C.-S.; Jung N.-C.
PATENT ASSIGNEE: Forestry Research Institute (Seoul; Korea); Lifetree Biotech Co. Ltd
SOURCE: PCT Patent Application
PATENT INFORMATION: WO 2004100970 A1
APPLICATION INFORMATION: 20030516
DOCUMENT TYPE: Patent
LANGUAGE: English
SUMMARY LANGUAGE: English
ABSTRACT: A lower alcohol-insoluble fraction of the young branch of Hovenia dulcis Thunb. having hepatoprotective and antihepatotoxic activities is disclosed. A method of obtaining the fraction involves extracting dried young branch of the plant with hot water under high **pressure** to obtain a hot water extract. The hot water extract is further dried at room **temperature**, evaporated under reduced **pressure**, and subjected to three or four cycles of reflux extraction with a lower alcohol such as methanol, butanol, ethanol, or their mixture to obtain a lower alcohol insoluble fraction. The extract is preferably derived from Hovenia dulcis var. latifolia Nakai or Hovenia dulcis var. tomentella Makino, preferably one to four-year old Hovenia dulcis Thunb. The invention is claimed to be suitable for incorporation into a pharmaceutical product for preventing or inhibiting liver diseases.
SUBJECT HEADING: FUNCTIONAL FOODS
CONTROLLED TERM: DISEASES; DRUGS; ESSENCES; EXTRACTS; FRACTIONS; FUNCTIONAL FOODS; HEPATOTOXICITY; HERB EXTRACTS; HERB PRODUCTS; HERBAL DRUGS; LIVER DISEASES; MEDICINES; PATENT; PCT PATENT; PLANT EXTRACTS; TOXICITY
DATA ENTRY DATE: 21 Dec 2004

L96 ANSWER 29 OF 37 CABA COPYRIGHT 2006 CABI on STN
ACCESSION NUMBER: 95:167993 CABA
DOCUMENT NUMBER: 19950314532
TITLE: Production of glucoamylase by nematophagous fungi of Arthrobotrys species
AUTHOR: Jaffar, M. B.; Bharata Ratnam, P.; Norouzian, D.; Irani, S. D.; Shetty, P.
CORPORATE SOURCE: Department of Biochemistry, Wilson College, Bombay 400 007, India.
SOURCE: Indian Journal of Experimental Biology, (1993) Vol. 31, No. 1, pp. 87-89. 9 ref.
ISSN: 0019-5189
DOCUMENT TYPE: Journal
LANGUAGE: English
ENTRY DATE: Entered STN: 20 Oct 1995
Last Updated on STN: 20 Oct 1995
ABSTRACT:
Arthrobotrys amerospora (ATCC 34468), A. conoides (ATCC 44454), A. robusta (ATCC 194759?) and A. oligospora produced glucoamylase on various media having ***starch*** as the carbon source. All these species produced glucoamylase,

and all except A. oligospora showed no transglucosidase activity. The glucoamylase showed negligible activity towards pullulan, palatinose and isomaltose, but high activity towards **branched** ***polysaccharides*** like amylopectin and glycogen; it **produced** only glucose from **soluble starch.**

~~CLASSIFICATION: QQ120 Microbial Technology in Food Processing~~
SEQUENCE CODE: CA; OU; ZB; PL; 1C
BROADER TERM: Arthrobotrys; Deuteromycotina; Eumycota; fungi
CONTROLLED TERM: **enzyme** activity; polysaccharides; hydrolysis; **starch**; culture media; biosynthesis
SUPPLEMENTARY TERM: Arthrobotrys conoides; Arthrobotrys robusta; **enzyme** specificity; glucan 1,4-alpha-glucosidase; Hyphomycetes; mitosporic fungi
CAS REGISTRY NUMBER: 9005-25-8
ORGANISM NAME: Arthrobotrys amerospora; Arthrobotrys oligospora; Arthrobotrys

L96 ANSWER 30 OF 37 BIOTECHDS COPYRIGHT 2006 THE THOMSON CORP. on STN
ACCESSION NUMBER: 2006-06903 BIOTECHDS
TITLE: Novel transformed Cyanobacteria obtained by introducing gene that encodes rice origin **starch** synthetase SSIIa to Cyanobacteria, useful for analyzing function of **starch** synthetase SSIIa;
rice **starch**-synthetase-SSIIa gene transfer and expression in cyanobacterium for **starch** -synthetase-SSIIa function analysis and **starch** production
AUTHOR: SUZUKI E; NAKAMURA Y; YOSHINO T; TAKAHASHI Y
PATENT ASSIGNEE: DOKURITSU GYOSEI HOJIN KAGAKU GIJUTSU SH
PATENT INFO: JP 2006034128 9 Feb 2006
APPLICATION INFO: JP 2004-215621 23 Jul 2004
PRIORITY INFO: JP 2004-215621 23 Jul 2004; JP 2004-215621 23 Jul 2004
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
OTHER SOURCE: WPI: 2006-149329 [16]
ABSTRACT: DERWENT ABSTRACT:
NOVELTY - A transformed Cyanobacteria (I) obtained by introducing a gene that encodes a rice origin **starch** synthetase SSIIa to Cyanobacteria, is new.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for: (1) analyzing (M1) function of the **starch** synthetase SSIIa, involves:(a) analyzing the storage polysaccharide extracted from the (I) being introduced with the gene encoding rice origin **starch** synthetase SSIIa; or (b) producing (I) being introduced with gene encoding precursor type **starch** synthetase SSIIa, and (I) being introduced with gene encoding mature type **starch** synthetase SSIIa, and analyzing and comparing the storage polysaccharide extracted from both; and (2) polysaccharide produced by (I).
BIOTECHNOLOGY - Preparation: (I) is obtained by introducing gene encoding **starch** synthetase SSIIa into Synechococcus sp. PCC 7942 strain (claimed). Preferred Cyanobacteria: In (I), the gene encoding the rice origin **starch** synthetase SSIIa is a gene that encodes precursor type **starch** synthetase SSIIa, or a gene that encodes mature type **starch** synthetase SSIIa.

(I) having gene encoding precursor type **starch** synthetase SSIIa, is obtained by transforming Cyanobacteria using a plasmid being inserted with a fully defined 2461 base pair (SEQ ID Number 1) sequence given in the specification. (I) having gene encoding mature type **starch** synthetase SSIIa, is obtained by transforming Cyanobacteria using a plasmid being inserted with a fully defined 2254 base pair (SEQ ID Number 4) sequence given in the specification. The plasmid for precursor type **starch** synthetase SSIIa expression was obtained by amplifying first half portion of a SSIIa gene from the plasmid being inserted with SEQ ID Number 1 by PCR using the forward primer comprising SEQ ID Number 7 and reverse primer comprising SEQ ID Number 9, coupling the amplified product comprising the first half portion of the gene, with the second half portion of the gene using the restriction **enzyme** BgIII cleavage site in the reverse primer, and inserting the acquired gene sequence in a plasmid. The plasmid for mature type **starch** synthetase SSIIa expression was obtained by amplifying first half portion of a SSIIa gene from the plasmid being inserted with SEQ ID Number 4 by PCR using the forward primer comprising SEQ ID Number 8 and reverse primer comprising SEQ ID Number 9, coupling the amplified product comprising the first half portion of the gene, with the second half portion of the gene using the restriction **enzyme** BgIII cleavage site in the reverse primer, and inserting the acquired gene sequence in a plasmid. The Cyanobacteria is Cyanobacteria of a Synechococcus genus. The Cyanobacteria is the defective strain of the gene that encodes endogenous glycogen synthase (GS). Preferred Method: In (M1), the analysis of storage polysaccharide is analysis of a chain-length distribution of the glucan chain obtained by carrying out **branch** cutting **processing** of the storage **polysaccharide.** The chain-length distribution analysis is carried out by capillary electrophoresis.

USE - (I) is useful for analyzing function of the **starch** synthetase SSIIa (claimed). (I) is useful in elucidating the function of **enzymes** involved in production of **starch**, japonica and indica varieties of rice plant. The polysaccharide produced by (I) is useful in food industry.(16 pages)

CLASSIFICATION: FOOD and FOOD, ADDITIVES; Food and Food, Additives; GENETIC TECHNIQUES and APPLICATIONS, Gene Expression Techniques and Analysis

CONTROLLED TERMS: PLASMID-MEDIATED RICE **STARCH**-SYNTHETASE-SSIIA GENE TRANSFER, EXPRESSION IN SYNECHOCOCCUS SP., CAPILLARY ELECTROPHORESIS, GLYCOGEN-SYNTHASE EXPRESSION EVALUATION, FORWARD, REVERSE DNA PRIMER, POLYMERASE CHAIN REACTION, APPL. **STARCH**-SYNTHETASE-SSIIA FUNCTION ANALYSIS, RICE **STARCH** PRODUCTION ELUCIDATION, FOOD MANUFACTURE **ENZYME** CYANOBACTERIUM HYBRIDIZATION DNA AMPLIFICATION POLYSACCHARIDE DNA SEQUENCE (25, 12)

L96 ANSWER 31 OF 37 BIOTECHDS COPYRIGHT 2006 THE THOMSON CORP. on STN

ACCESSION NUMBER: 2004-09830 BIOTECHDS

TITLE: Producing glucosamine or N-acetylglucosamine by fermentation involves culturing microorganism comprising glucosamine-6-phosphate acetyltransferase, in fermentation medium, and collecting product;
glucosamine and N-acetylglucosamine production via

recombinant bacterium and fungus culture

AUTHOR: DENG M; ANGERER J D; CYRON D; GRUND A D; JERRELL T A; LEANNA C; MATHRE O; ROSSON R; RUNNING J; SEVERSON D; SONG L; WASSINK S

PATENT ASSIGNEE: ARKION LIFE SCI LLC

PATENT INFO: WO 2004003175 8 Jan 2004

APPLICATION INFO: WO 2003-US20925 1 Jul 2003

PRIORITY INFO: US 2002-393348 1 Jul 2002; US 2002-393348 1 Jul 2002

DOCUMENT TYPE: Patent

LANGUAGE: English

OTHER SOURCE: WPI: 2004-203380 [19]

ABSTRACT: DERWENT ABSTRACT:

NOVELTY - Producing (M1) glucosamine or N-acetylglucosamine by fermentation comprising culturing in a fermentation medium a microorganism (I) which comprises endogenous glucosamine-6-phosphate acetyltransferase (II) and a genetic modification that increases the activity of (II), and collecting a product produced from the step of culturing, which is chosen from the group consisting of glucosamine-6-phosphate, glucosamine, is new.

DETAILED DESCRIPTION - Producing (M1) glucosamine or N-acetylglucosamine by fermentation involves (a) culturing in a fermentation medium a microorganism (I) which comprises endogenous glucosamine-6-phosphate acetyltransferase (II) and a genetic modification that increases the activity of (II), glucosamine-6-phosphate synthase (III) or glucosamine-6-phosphate deaminase (IV), or decreases the activity of (IV) and increases the activity of glucosamine-1 phosphate N-acetyltransferase (V), and (b) collecting a product produced from the step of culturing, which is chosen from the group consisting of glucosamine-6-phosphate, glucosamine, glucosamine-1-phosphate, N-acetylglucosamine-1-phosphate, N-acetylglucosamine-6-phosphate, and N-acetylglucosamine. INDEPENDENT CLAIMS are also included for the following: (1) a genetically modified microorganism (VI) comprising a genetic modification that increases the activity of (II); (2) a genetically modified microorganisms (VII) comprising a genetic modification that increases the activity of (IV); (3) a genetically modified microorganisms (VIII) comprising a genetic modification that decreases the activity of (IV) and increases the activity of (V); (4) producing (M2), N-acetylglucosamine involves obtaining a fermentation broth containing solubilized N-acetylglucosamine that is a product of a fermentation process, and recovering N-acetylglucosamine-containing solids from the fermentation broth; (5) producing (M3), glucosamine form a source of N-acetylglucosamine, comprising obtaining a source of N-acetylglucosamine from N-acetylglucosamine, N-acetylglucosamine-6-phosphate or N-acetylglucosamine-1-phosphate and treating the source of N-acetylglucosamine to produce a glucosamine product such as glucosamine, glucosamine-6-phosphate and glucosamine-1-phosphate; and (6) producing (M4), glucosamine by fermentation comprising culturing (I) in a fermentation medium, and collecting a product such as glucosamine-6-phosphate or glucosamine which is produced by the culturing step, where (I) has been transformed with a recombinant nucleic acid molecule comprising a nucleic acid sequence encoding glucosamine-6-phosphate, the expression of the recombinant nucleic acid molecule is controlled by a lactose induction,

and the culturing step involves growing the microorganism in the fermentation medium comprising glucose as a carbon source at a pH 4.5-7 and at a **temperature** of 25-37 degrees Centigrade, inducing transcription of the nucleic acid sequence by addition of lactose to the fermentation medium in the absence of adding additional glucose to the medium, and fermenting the microorganism after the inducing step, in the presence of lactose at pH 4.5-6.7 and at **temperature** 25-37 degrees Centigrade.

BIOTECHNOLOGY - Preferred Method: (M1) further involves recovering a product, dephosphorylating the product such as glucosamine-6-phosphate and glucosamine-1-phosphate to produce glucosamine, or dephosphorylating the product such as N-glucosamine-6-phosphate and N-glucosamine-1-phosphate to produce N-accetylglucosamine, and treating a product such as N-acetylglucosamine, N-acetylglucosamine-6-phosphate and N-acetylglucosamine-1-phosphate, under acid and heat conditions or by enzymatic deacetylation to produce a glucosamine product such as glucosamine, glucosamine-6-phosphate or glucosamine-1-phosphate. N-glucosamine produced by the fermentation is recovered by precipitating or crystallizing N-glucosamine-containing solids from the fermentation broth. In (M1), the culturing step includes the step of maintaining the carbon source at a concentration of 0.5%-5% in the fermentation medium. The fermentation medium comprises yeast extract, glucose and ribose or gluconic acid. The carbon source in the fermentation medium is chosen from glucose, fructose, a pentose sugar, lactose and gluconic acid, where the pentose sugar is ribose, xylose or arabinose. The culturing step is performed at a **temperature** of 25-45 degrees Centigrade, preferably 37 degrees Centigrade, and at a pH of 4-7.5, preferably 6.7-7.5 or 4.5-5. The microorganism is chosen from bacteria and fungi, or bacteria and yeast. The bacterium is chosen from a genus Escherichia, Bacillus, Lactobacillus, Pseudomonas and Streptomyces. The fungi is chosen from a genus Aspergillus, Absidia, Rhizopus, Chrysosporium, Neurospora and Trichoderma. The yeast is chosen from genus Saccharomyces, Candida, Hansenula, Pichia, Klveromyces and Phaffia. In (M1), the collecting step involves recovering an intracellular product from the microorganism chosen from intracellular glucosamine-6-phosphate, glucosamine-1-phosphate, N-acetylglucosamine-6-phosphate, N-acetylglucosamine-1-phosphate, N-acetylglucosamine and glucosamine or recovering an extracellular product from the fermentation medium chosen from glucosamine and N-acetylglucosamine. In (I) of (M1), the genetic modification to increase the activity of (II), (V) or glucosamine-6-phosphate N-acetyltransferase (IX) provides a result chosen from increased enzymatic activity of (II), (V) or (IV), overexpression of (II), (V) or (IV) by the microorganisms, reduced N-acetylglucosamine-6-phosphate product inhibition of (II), (V) or (IV) and increased affinity of (II), (V) or (IV) for glucosamine-6-phosphate. (I) is transformed with a recombinant nucleic acid molecule comprising a nucleic acid sequence encoding (II), where the nucleic acid encoding (II) has a genetic modification which increases the enzymatic activity of (II). (II) has enzyme activity and comprises a fully defined sequences (S1) of 159, 149 or 149 amino acids as given in the specification, or an amino acid sequence that is at least 35%, 50% or 70%

identical to (S1). The expression of the recombinant nucleic acid molecule is inducible by lactose. (I) further comprises a genetic modification to reduce inhibition of transcription induction by lactose, where the genetic modification comprises a partial or complete deletion or inactivation of a gene encoding a LacI repressor protein. (I) further comprises a genetic modification that increases the activity of (III), phosphoglucoisomerase in microorganisms, a glutamine synthetase or glucose-6-phosphate dehydrogenase, or decreases the activity of (IV). (III) has a modification to reduce product inhibition of (III) as compared to the wild-type glucosamine-6-phosphate synthase. (III) has enzymatic activity and comprises a sequences (S2) chosen from 6 fully defined sequence of 609 amino acids or a fully defined sequence of 600, 717 or 713 amino acids as given in the specification, or an amino acid sequence that is at least 35%, 50% or 70% identical to (S2). (III) preferably contains a sequence chosen from 6 fully defined sequence of 609 amino acids as given in the specification. (I) is transformed with a recombinant nucleic acid molecule comprising a nucleic acid sequence encoding (III), or phosphoglucoisomerase, glutamine synthetase or glucose-6-phosphate dehydragenase which comprises a fully defined sequence of 549, 469 or 491 amino acids respectively, as given in the specification. The genetic modification to decrease or increase the activity of (IV) involves a partial or complete deletion or inactivation of an endogenous gene encoding (IV) in the micro organism. (I) further comprises a partial or complete deletion, or inactivation of phosphofructokinase or genes encoding enzymes responsible for glycogen synthesis in the microorganisms, where the genes encoding enzymes responsible for glycogen synthesis comprise ADP-**glucose** pyrophosphorylase, glycogen synthase and a **branching** enzyme. The genetic modifications do not inhibit the ability of (I) to metabolize galactose. In (I), the genetic modification that increases the activity of (IV), provides a results chosen from overexpression of (IV), by the microorganisms, increased enzymatic activity of (IV), increased reverse reaction or reduced forward reaction of (IV) to form glucosamine-6-phosphate, increased or reduced affinity of (IV), for glucosamine-6-phosphate, and reduced glucosamine-6-phosphate product inhibition of (IV). (I) is transformed with a recombinant nucleic acid molecule comprising a nucleic acid sequences encoding (IV) which has a genetic modification to increase the enzymatic activity of (IV), nucleic acid sequence encoding glucosamine-1-phosphate N-acetyltransferase/N-acetylglucosamine-1-phosphate uridyltransferase (X), nucleic acid sequence encoding truncated (X) having, glucosamine-1-phosphate N-acetyltransferase (XI) activity and reduced or no N-acetylglucosamine-1-phosphate uridyltransferase activity, or nucleic acid sequence encoding (XI), where (X) or (XI) has a genetic modification which increases the activity of (X) or (XII). The (IV), (X) or truncated (X) comprises a fully defined sequence of 266 amino acids (S4), 456 amino acids (S4) or 380 amino acids (S5), respectively as given in the specification, or amino acids sequence that is at least 35% identical to (S3), (S4) or (S5) respectively. (I) further comprises a genetic modification to decrease the activity of (III) and/or increase the activity of (VI), (V) or

bifunctional (X). The (IX) comprises (S1) or amino acids sequence identical to (S1). (M2) further involves removing the cellular material from the fermentation broth, contacting the fermentation broth with an ion exchange resin such as anion and a cation exchange resin or mixed bed of anion and cation exchange resins, decolorizing the fermentation broth which is chosen from multiple N-acetylglucosamine crystallizations, activated carbon treatment and chromatographic decolorization, and recovering the product by precipitating or crystallizing N-acetylglucosamine-containing solids from the fermentation broth, and concentrating the fermentation broth containing solubilized N-acetylglucosamine. The concentration step is conducted at less than atmospheric **pressure** by membrane separation, at a **temperature** of 40-75 degrees Centigrade, preferably 45-55 degrees Centigrade. The concentrating step is conducted to achieve a solids content in the fermentation broth of at least 40% or 45% solids. (M2) further involves cooling the fermentation broth after concentrating step, at -5 degrees Centigrade-45 degrees Centigrade, preferably between -5 degrees Centigrade and room **temperature**, most preferably room **temperature** . (M2) further involves seeding the fermentation broth with crystals of N-acetylglucosamine, recovering the product by contacting N-acetylglucosamine with a water miscible solvent, drying the recovered N-acetylglucosamine containing solids and washing it with a water miscible solvent. (M2) further involves dissolving the recovered N-acetylglucosamine-containing solids to form an N-acetylglucosamine solution and recovering N-acetylglucosamine-containing solids from the solution, and filtering the fermentation broth to remove bacterial endotoxins. The seed crystals are chosen from the group consisting of N-acetylglucosamine crystals formed by nucleation in the fermentation broth and externally provided N-acetylglucosamine crystals. The water miscible solvent is isopropyl alcohol (IPA) ethanol, methanol, acetone, tetrahydrofuran, dimethylsulfoxide, dimethylformamide, dioxane and acetonitrile. In (M3), the source of N-acetylglucosamine is at least 40% N-acetylglucosamine of dry solids in the source, and is produced by a fermentation process. The source of N-acetylglucosamine is provided as a solid or in suspended in a solution such as aqueous, low-boiling, primary or secondary alcohol. The treating step involves contacting the source of N-acetylglucosamine with a deacetylating enzyme in the presence of aqueous sodium or calcium chloride solution, or alcohol to esterify the alcohol, to produce the glucosamine product, and hydrolyzing the source of N-acetylglucosamine under acid using hydrochloric acid at a concentration of 10-40% by weight, and heat conditions, at 60-100 degrees Centigrade, preferably 70-90 degrees Centigrade, the hydrolyzing step is performed for 10 minutes to 24 hours. The ratio of the weight of hydrochloric acid solution to the source of N-acetylglucosamine as a pure dry weight is from 1:1-5:1. The deacetylating enzyme is immobilized on a substrate, and is N-acetylglucosamine-6-P deacetylase or N-acetylglucosamine deacetylase, where the deacetylating enzyme is a chitin deacetylase that has been modified to or selected for its ability to deacetylate an N-acetylglucosamine monomer to produce glucosamine. (M3) further involves cooling the

hydrolyzed solution at -5 degrees Centigrade-40 degrees Centigrade to precipitate the glucosamine hydrochloride and recovering the precipitated glucosamine hydrochloride-containing solids from the solution, where the recovering step involves collecting the precipitated glucosamine hydrochloride-containing solids, washing it with water miscible solvent, drying the glucosamine hydrochloride-containing solids, dissolving the solids in water to form a solution, adjusting the pH of the solution to 2.5-4, contacting the solution with activated carbon to decolorize the glucosamine hydrochloride-containing solids, removing the activated carbon from the solution and crystallizing glucosamine hydrochloride from the solution which involves concentrating the glucosamine hydrochloride at a **temperature** of less than 50 degrees Centigrade, less than atmospheric **pressure.** The hydrolyzing step is performed by continuously blending the source of N-acetylglucosamine with a hydrochloric acid solution or a recycled hydrolysis mother liquor to maintain the source of N-acetylglucosamine as a dissolved solution, followed by addition of anhydrous hydrochloric acid under heat conditions to initiate hydrolysis and convert the N-acetyglucosamine to glucosamine hydrochloride. The hydrolysis step is performed at **temperature** 60-100degrees and at the solution boiling point at one atmosphere. The recovery step involves adding primary or secondary alcohol such as methanol, isopropanol, ethanol, n-propanol, n-butanol or sec-butanol, to the hydrolysis solution before the hydrolysis step. The drying of crystallized glucosamine hydrochloride is conducted at less than 70 degrees Centigrade for less than 6 hours with an air sweep. (M3) involves a further step of removing the acetic acid ester formed with the alcohol following the hydrolysis step, before recycling the hydrolysis solution for reuse, where the acetic acid ester is removed by distillation, flashing or concentration at less than atmospheric **pressure.** (M3) further involves crystallization, precipitation, mixing a salt with the glucosamine product and contacting the obtain mixture with an ion exchange medium. The salt is chloride, phosphate, a sulfate, an iodide or a bisulfate. In (M4), trace elements include iron and the organisms are grown at pH 6.1. The organisms are fermented in the presence of glucose at a pH 4.5-5, preferably 6.7. Preferred Microorganisms: (VI) further comprises genetic modification that increase the activity of (III), or decrease the activity of (IV). (VII) further comprises genetic modification that increase the activity of (IX) or (V), or decrease the activity of (III). (VIII) further comprises a genetic modification that increase activity of (III).

USE - (M1) is useful for producing glucosamine or N-acetylglucosamine by fermentation (claimed).

EXAMPLE - Recombinant Escherichia coli was inoculated into the fermentation medium comprising 5 to 10 g/l-1 of lactose, and 65% of glucose which was fed into the fermentation medium at 6.5 gl-1 hr-1, at pH 6.9 and a **temperature** of 37 degrees Centigrade. The 20% of oxygen was controlled by agitation. The fermentation was allowed for 60-72 hours and the fermentation broth was obtained which was subjected to filteration and micro-filtration to remove the cells. Depending on the

fermentation conditions, the percentage of N-acetylglucosamine in the dissolved solid ranged from 70 to 87%. The crude N-acetylglucosamine product was subjected to a combination of cation and anion deionization steps to increase N-acetylglucosamine purity in the crude broth. Activated carbon was added to a fermentation sample (30 g/l) containing 87% (w) N-acetylglucosamine in the dissolved solid and the mixture was stirred at room **temperature** for an hour followed by filtration using medium filter paper. The filtrate showed reduced color and was pale yellowish brown. The amount of solid was measured and the percentage of N-acetylglucosamine in the solid was 88%. The carbon treated sample containing 80.5 g solid was concentrated at 45 degrees Centigrade-50 degrees Centigrade vacuum to 45% (w) solid and shaken at room **temperature** for 16 hours. The precipitate was collected by filtration on medium filter paper and washed with ethanol. After drying under vacuum, 33.2 grams of white solid was obtained. The obtained white solid was 100% pure N-acetylglucosamine and the recovery was 47%. (326 pages)

CLASSIFICATION: OTHER CHEMICALS, Miscellaneous Chemicals; GENETIC TECHNIQUES and APPLICATIONS, Gene Expression Techniques and Analysis; BIOMANUFACTURING and BIOCATALYSIS, Fermentation; BIOMANUFACTURING and BIOCATALYSIS, Biocatalyst Application

CONTROLLED TERMS: GLUCOSAMINE, N-ACETYLGLUCOSAMINE PREP., GENETICALLY MODIFIED ESCHERICHIA COLI, BACILLUS SP., LACTOBACILLUS SP., PSEUDOMONA SP., STREPTOMYCES SP., ASPERGILLUS SP., ABSIDIA SP., RHIZOPUS SP., NEUROSPORA SP., TRICHODERMA SP., SACCHAROMYCES SP., CANDIDA SP., HANSENULA SP., PICHIA SP., KLVEROMYCES SP., PHAFFIA SP. CULTURE MEDIUM FERMENTATION, GLUCOSAMINE-6-PHOSPHATE-ACETYLTRANSFERASE, GLUCOSAMINE-6-PHOSPHATE-SYNTHASE, GLUCOSAMINE-6-PHOSPHATE-DEAMINASE ENZYME EC-2.3.1.4 STRAIN IMPROVEMENT BACTERIUM LACTIC ACID DEGRADATION FUNGUS YEAST DNA SEQUENCE PROTEIN SEQUENCE (23, 20)

L96 ANSWER 32 OF 37 BIOTECHDS COPYRIGHT 2006 THE THOMSON CORP. on STN

ACCESSION NUMBER: 1997-03924 BIOTECHDS

TITLE: Modulation of Bacillus amylolytic **enzymes** and production of branched oligosaccharides; Bacillus licheniformis maltogenic amylase and thermostable alpha-amylase **enzyme** engineering and immobilization; glucose and maltose removal using Saccharomyces cerevisiae (conference paper)

AUTHOR: Cheong T K; Kim T J; Kim M J; Choi Y D; Kim I C; Kim J W; Park K H

CORPORATE SOURCE: Univ.Seoul-Nat.; Samyang-Genex; Univ.Inchon

LOCATION: Department of Food Science and Technology, Seoul National University, Suwon, 441-744, Korea.

SOURCE: Prog.Biotechnol.; (1996) 12, 43-60
CODEN: PBITE3
ISSN: 0921-0423
Enzymes for Carbohydrate Engineering, Symposium, Suwon, Korea, August, 1994 and September, 1995.

DOCUMENT TYPE: Journal

LANGUAGE: English

ABSTRACT: Maltogenic amylase (BLMA) and thermostable alpha-amylase (BLTA, EC-3.2.1.1) from Bacillus licheniformis were tested for branched oligosaccharide (BOS) food-additive production. 30% Maize **starch** suspension in 50 mM maleate-NaOH buffer (pH 6.8) was liquefied using BLTA, and run through a

column of BLMA, immobilized on a CPC-silica support, at 45-50 deg (residence time 2.5 hr). The **product** contained over 60% BOS, including panose, **branched** DP4 and D5P, etc. **Glucose** and maltose were removed by fermentation with Saccharomyces cerevisiae var. ellipsoideus (immobilized on a sodium alginate matrix support) at 27-28 deg for 2 days, giving over 90% BOS. Genes encoding BLTA and BLTA were cloned in Escherichia coli and subjected to oligonucleotide site-directed mutagenesis to alter the ratio of alpha-1,4- to alpha-1,6-bond hydrolysis, and to alter substrate specificity. His-250 and Asp-420 of BLMA were important in hydrolytic activity, but transferase activity was not altered by mutating these residues. The mutant **enzymes** showed preference to **starch** over pullulan as a substrate, which could be useful in BOS production. (37 ref)

CLASSIFICATION: F FOOD; F1 Food and Food Additives; K BIOCATALYSIS; K2 Application; K BIOCATALYSIS; K1 Isolation and Characterization; A GENETIC ENGINEERING AND FERMENTATION; A1 Nucleic Acid Technology; A GENETIC ENGINEERING AND FERMENTATION; A2 Fermentation

CONTROLLED TERMS: CONTINUOUS BRANCHED OLIGOSACCHARIDE PREP., BACILLUS LICHENIFORMIS MALTOGENIC AMYLASE, THERMOSTABLE ALPHA-AMYLASE IMMOBILIZATION, CPC-SILICA SUPPORT, GLUCOSE, MALTOSE REMOVAL, IMMOBILIZED SACCHAROMYCES CEREVISIAE, **ENZYME** ENGINEERING, ALTERED SUBSTRATE SPECIFICITY, APPL. FOOD-ADDITIVE SUGAR THERMOPHILIC BACTERIUM EC-3.2.1.1 YEAST FUNGUS FERMENTATION PROTEIN ENGINEERING GENE CLONING EXPRESSION ESCHERICHIA COLI (VOL.16, NO.7)

L96 ANSWER 33 OF 37 BIOTECHDS COPYRIGHT 2006 THE THOMSON CORP. on STN

ACCESSION NUMBER: 1992-10949 BIOTECHDS

TITLE: A method for the production of glucose-transferred product; branched oligosaccharide production using Aspergillus niger alpha-amylase and alpha-glucosidase activity on **starch** hydrolyzate

PATENT ASSIGNEE: Nippon-Corn-Starch

PATENT INFO: JP 04148693 21 May 1992

APPLICATION INFO: JP 1990-270749 9 Oct 1990

PRIORITY INFO: JP 1990-270749 9 Oct 1990

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

OTHER SOURCE: WPI: 1992-222978 [27]

ABSTRACT: A method for the production of glucose-transferred products is new. It is characterized by reacting (i.) alpha-amylase (EC-3.2.1.1), which can form maltose from maltotriose, and (ii.) alpha-glucosidase (EC-3.2.1.20) with **starch** hydrolyzate (SH) or a mixture of SH and a substrate for alpha-glucosidase. SH having a DE of 1-20, preferably 1-10 can be used. When using SH alone, glucose and maltose serve as the substrate for alpha-glucosidase. When other substrates such as sucrose are required, the substrate is added to the SH. Alpha-glucosidase with high glucosyl transferring activity originating from Aspergillus niger is preferred. Branched oligosaccharides having alpha-1-6 bonds such as isomaltose, panose, isomaltotriose, ceanderose, etc. can be prepared in a high yield. By adding alpha-amylase which forms maltose from maltotriose, the maximum content of glucose-transferred product can be increased and the time required to reach this maximum is reduced. The produced

branched oligosaccharides may be used to promote the growth of Bifidus spp., and also have tooth non-decaying properties. (5pp)

CLASSIFICATION: F FOOD ADDITIVES AND SCP; F1 Food Additives and SCP; K BIOCATALYSIS; K2 Application

CONTROLLED TERMS: **GLUCOSE**-TRANSFERRED **BRANCHED** OLIGOSACCHARIDE **PREP.**, ASPERGILLUS NIGER ALPHA-AMYLASE, ALPHA-GLUCOSIDASE ACT. ON **STARCH** HYDROLYZATE FUNGUS **ENZYME** EC-3.2.1.1 EC-3.2.1.20 SUGAR

L96 ANSWER 34 OF 37 BIOTECHDS COPYRIGHT 2006 THE THOMSON CORP. on STN

ACCESSION NUMBER: 1991-14903 BIOTECHDS

TITLE: Branched oligosaccharide preparation; liquified **starch** saccharification using Aspergillus, Rhizopus or Mucor transglycosidase and Streptomyces, Bacillus or Pseudomonas amylase; use as sweetener, etc.

PATENT ASSIGNEE: Gunei-Chem.

PATENT INFO: JP 03187390 15 Aug 1991

APPLICATION INFO: JP 1989-327577 18 Dec 1989

PRIORITY INFO: JP 1989-327577 18 Dec 1989

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

OTHER SOURCE: WPI: 1991-284370 [39]

ABSTRACT: A branched oligosaccharide is produced by incubation of liquified **starch** with a transglycosidase and an amylase which generates mainly maltotriose or maltotetraose. The transglycosidase is preferably derived from Aspergillus sp., Rhizopus sp. or Mucor sp. The maltotriose-generating amylase is preferably derived from Streptomyces sp. or Bacillus sp., and the maltotetraose-generating amylase is derived from Pseudomonas sp. or Bacillus sp. The quantity of transglycosidase is 30-3,000 U/g solid **starch.** The quantity of amylase is 0.01-3.0 weight/weight% against solid **starch.** The **enzymes** act on liquified **starch** at 40-65 deg, pH 4-8, for 30-90 hr. Using this method, a branched oligosaccharide mostly composed of a **branched** trisaccharide and containing little **glucose** if **produced** efficiently. The **product** may be used as a sweetener, a functional sugar or a Bifidobacterium propagator. (4pp)

CLASSIFICATION: F FOOD ADDITIVES AND SCP; F1 Food Additives and SCP; K BIOCATALYSIS; K2 Application

CONTROLLED TERMS: BRANCHED OLIGOSACCHARIDE PREP., LIQUIFIED **STARCH** SACCHARIFICATION WITH ASPERGILLUS SP., RHIZOPUS SP., MUCOR SP. TRANSGLYCOSIDASE, STREPTOMYCES SP., BACILLUS SP. OR PSEUDOMONAS SP. MALTOTRIOSE- OR MALTOTETRAOSE-GENERATING AMYLASE, POT. APPL. SWEETENER, ETC. POLYSACCHARIDE SUGAR BACTERIUM FUNGUS

L96 ANSWER 35 OF 37 BIOTECHDS COPYRIGHT 2006 THE THOMSON CORP. on STN

ACCESSION NUMBER: 1988-09010 BIOTECHDS

TITLE: Continuous production of branched oligosaccharide syrup; from glucose using immobilized glucoamylase

PATENT ASSIGNEE: Showa-Agric.

PATENT INFO: JP 38109791 B 14 May 1988

APPLICATION INFO: JP 1986-256242 27 Oct 1986

PRIORITY INFO: JP 1986-256242 27 Oct 1986

DOCUMENT TYPE: Patent

LANGUAGE: Japanese
OTHER SOURCE: WPI: 1988-171783 [25]
ABSTRACT: Branched oligosaccharide syrup is continuously produced by flowing aqueous glucose (solid concentration at least 60%, glucose contained at least 70% of solid) at a **temperature** higher than 60 deg through a packed bed reactor containing an immobilized **enzyme**. The invention allows highly branched oligosaccharide syrup to be obtained on an industrial scale. The **enzyme** reaction is performed at a relatively high **temperature**, so that microbial contamination is low and a constant quality product can be obtained. In an example, 400 ml of commercial immobilized glucoamylase (EC-3.2.1.3) was packed into a jacketed column (50 x 35 cm). Water at 60 deg was circulated through the jacket. Highly purified 75% aqueous solution of glucose (DE 97.5) was flowed continuously through the column. The composition of the syrup obtained after 10, 50, 70 and 100 days of operation was 44.0, 44.8, 44.0, 42.6% of solid, respectively. (3pp)
CLASSIFICATION: F FOOD ADDITIVES AND SCP; F1 Food Additives and SCP; K BIOCATALYSIS; K2 Application
CONTROLLED TERMS: CONTINUOUS **BRANCHED** OLIGOSACCHARIDE **PREP.** FROM **GLUCOSE**, IMMOBILIZED GLUCOAMYLASE SUGAR **ENZYME** EC-3.2.1.3

L96 ANSWER 36 OF 37 BIOTECHDS COPYRIGHT 2006 THE THOMSON CORP. on STN
ACCESSION NUMBER: 1987-01535 BIOTECHDS
TITLE: A preparation method for branched oligosaccharide syrup through the condensing reaction at high **temperature** ; using glucoamylase **enzyme**
PATENT ASSIGNEE: Showa
PATENT INFO: JP 61219392 29 Sep 1986
APPLICATION INFO: JP 1985-61248 25 Mar 1985
PRIORITY INFO: JP 1985-61248 25 Mar 1985
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
OTHER SOURCE: WPI: 1986-296106 [45]
ABSTRACT: A process is described for the production of branched oligosaccharide syrup (I) and comprises treating an aqueous glucose solution of solid concentration above 60% with an **enzyme** showing condensing activity on sugars at above 55 deg and then, if necessary, removing sugars other than (I) from the reaction product. It was found that though glucoamylases (EC-3.2.1.3) from Aspergillus niger and Rhizopus are inactivated at above 60 and 55 deg, respectively, by using them for saccharification, by using them at those **temperature** or higher they are not inactivated and their reaction velocity is even increased with rising **temperature** The (I) prepared contain isomaltose, panose, maltotriose, have low tooth-decaying activity and can be used in the food and drink industry and in medicines etc. The syrup prepared contains about 40% branched oligosaccharide which can be increased by refining the syrup. (7pp)
CLASSIFICATION: F FOOD ADDITIVES AND SCP; F1 Food Additives and SCP; D PHARMACEUTICALS; D5 Other Pharmaceuticals; K BIOCATALYSIS; K2 Application
CONTROLLED TERMS: **BRANCHED** OLIGOSACCHARIDE SYRUP **PREP.** FROM **GLUCOSE**, GLUCOAMYLASE, HIGH **TEMP.** REACTION

SWEETENER SUGAR SWEETENER **ENZYME** EC-3.2.1.3
ASPERGILUS NIGER RHIZOPUS FUNGUS ISOMALTOSE PANOSE
MALTOTRIOSE FUNGUS ISOMALTOSE PANOSE MALTOTRIOSE

L96 ANSWER 37 OF 37 BIOTECHDS COPYRIGHT 2006 THE THOMSON CORP. on STN
ACCESSION NUMBER: 1987-11006 BIOTECHDS
TITLE: The production of a special carbohydrase by Thermoactinomyces (Tha.) vulgaris;
enzyme characterization (conference abstract)
AUTHOR: Klingenberg P; Koerner D; Schalinatus E; Richter M
LOCATION: Central Institute of Nutrition, GDR Academy of Sciences, Bergholz-Rehbruecke, DDR.
SOURCE: Biol.Biochem.Biomed.Aspects Actinomycete; (1986) 32, 6 Meet., 416
DOCUMENT TYPE: Journal
LANGUAGE: English
ABSTRACT: Thermoactinomyces vulgaris is the producer of the thermostable protease 'Thermitase'. A special carbohydrase is synthesized, growth-associated, in the protease-producing corn steep liquor/**starch** medium. It is possible to isolate selectants with different productivity by an agar-diffusion test with potato **starch** as substrate. This endogenous amylase has a **temperature** optimum of 50-60 deg and a pH optimum of around 5. After the hydrolysis of linear or **branched starch polysaccharides**, the main splitting **products** are G2-G5 sugars and the amylase from T. vulgaris can hydrolyze glycogen up to 20%. Both are in contrast to commercial alpha-amylases (EC-3.2.1.1) from Bacillus subtilis and Aspergillus oryzae and to the saccharifying alpha-amylase from the strain R-47 of T. vulgaris. (2 ref)
CLASSIFICATION: K BIOCATALYSIS; K1 Isolation and Characterization
CONTROLLED TERMS: AMYLASE PREP., CHARACTERIZATION, THERMOACTINOMYCES VULGARIS **ENZYME** BACTERIUM

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